THE STUDY OF ARCHITECTURAL DESIGN

JOHN F. HARBESON

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THE STUDY OF ARCHITECTURAL DESIGN

"Tarpeian Rock, Rome", Rendering in Tempera by Jacques Carlu, Ier Grand Prix de Rome, 1919.
One of a series of studies of Royal and Republican Rome made by M. Carlu
while a Fellow at the French Academy at Rome.

Size of Original 48" x 42"

THE STUDY OF ARCHITECTURAL DESIGN

WITH SPECIAL REFERENCE TO
THE PROGRAM OF THE BEAUX-ARTS INSTITUTE OF DESIGN

By

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Foreword By

LLOYD WARREN

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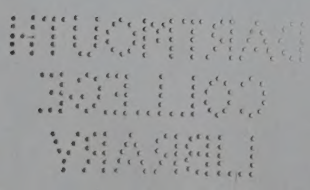

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PREFACE

IN TEACHING architectural design I have found that there were many things I had to say over and over again to each student before they would finally "sink in" to his consciousness and become a part of his mental processes; at first his mind is not quite ready, and yet an idea of the direction the training is taking is necessary to make that training develop properly. This was especially so during the World War, when, one by one, the older students left for service and the younger ones were left without that "older brother" teaching which is one of the backbones of architectural training. There would be the same story in the case of a newly formed atelier.

It was with this in mind that I first wrote the chapters that appeared in PENCIL POINTS in 1921 and are here published with revisions and additions. For I had often thought that a good deal of the instructor's time would be saved if these underlying principles could be given in some sort of handbook, which the student could study at will, and which would leave the instructor's time that much the more free for criticizing the individual problem. Therefore, this work is not intended as a substitute for personal instruction and criticism, but as an aid to it. It aims to put into convenient form the instructions in regard to the manner of studying architectural design which would otherwise have to be repeated many times by the instructor to each student or group of students.

It is because I have found many of the younger students thirsting for any knowledge that will help them to get well started in the Beaux-Arts Institute system that I believe these chapters will be of benefit to them in following its program.

THE AUTHOR

LLOYD WARREN

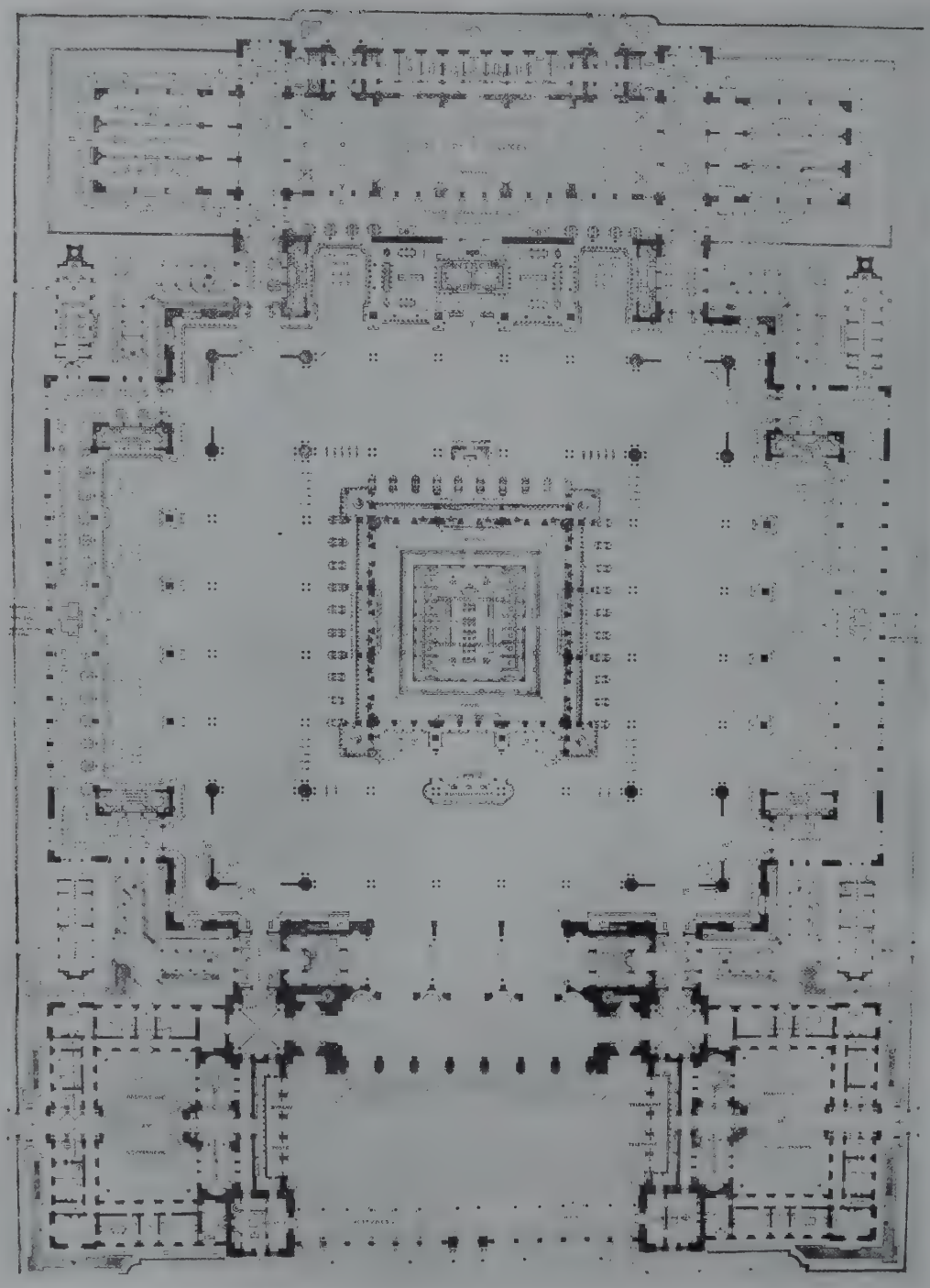
1869-1922

From the Portrait Bust by Fred B. Clarke

To

LLOYD WARREN

FOUNDER OF THE BEAUX-ARTS INSTITUTE
OF DESIGN, THE FIRST AMERICAN TO RECEIVE
THE DIPLOMA AT THE ECOLE DES BEAUX
ARTS, THIS WORK IS RESPECTFULLY DEDICATED
BY THE AUTHOR



"A Bank," by Tony Garnier. Plan from "Le Concours du Grand Prix de Rome d'Architecture."

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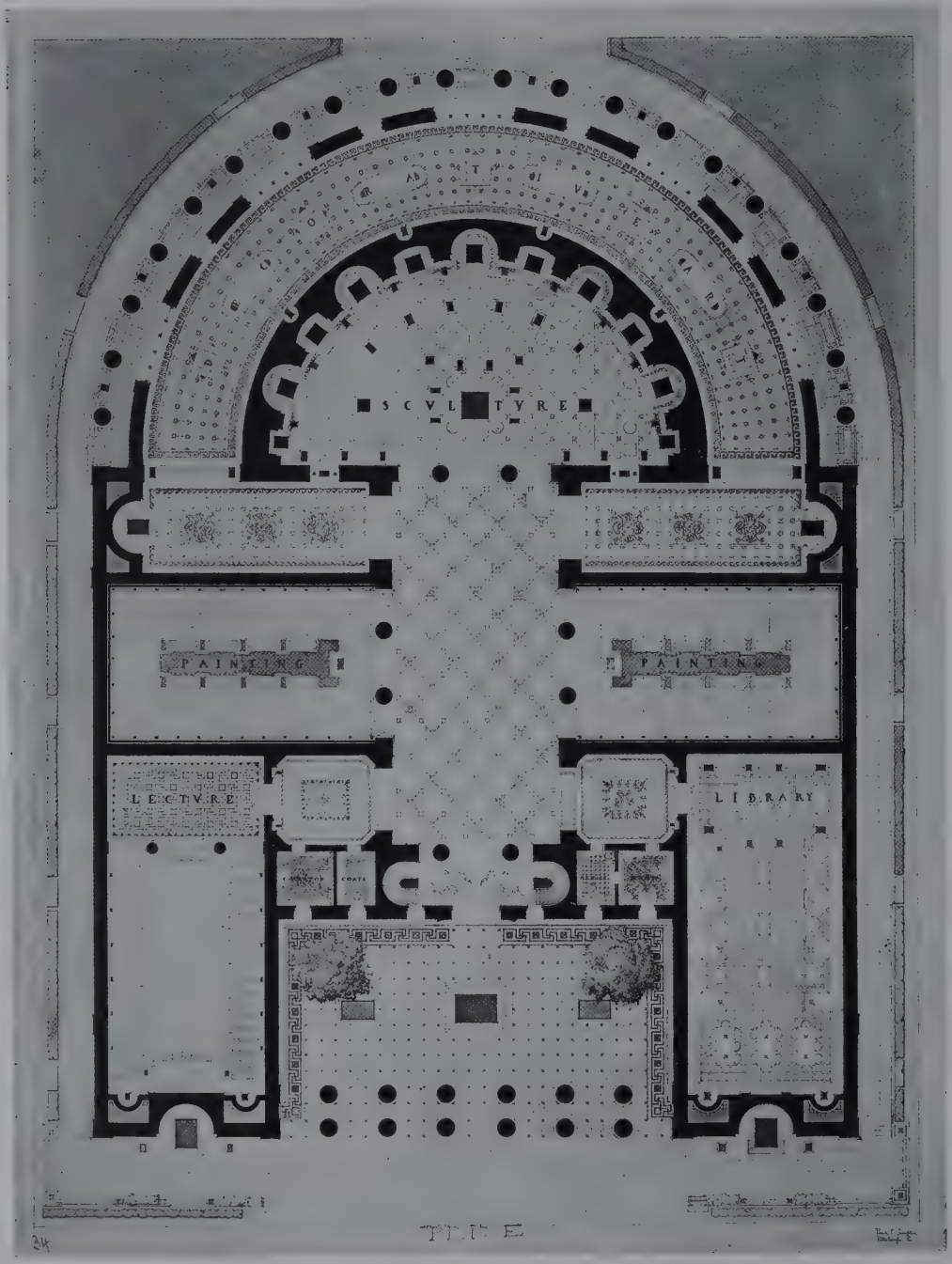

"A Municipal Art Gallery," by Paul F. Simpson
Winner of Le Brun Travelling Scholarship, 1923.

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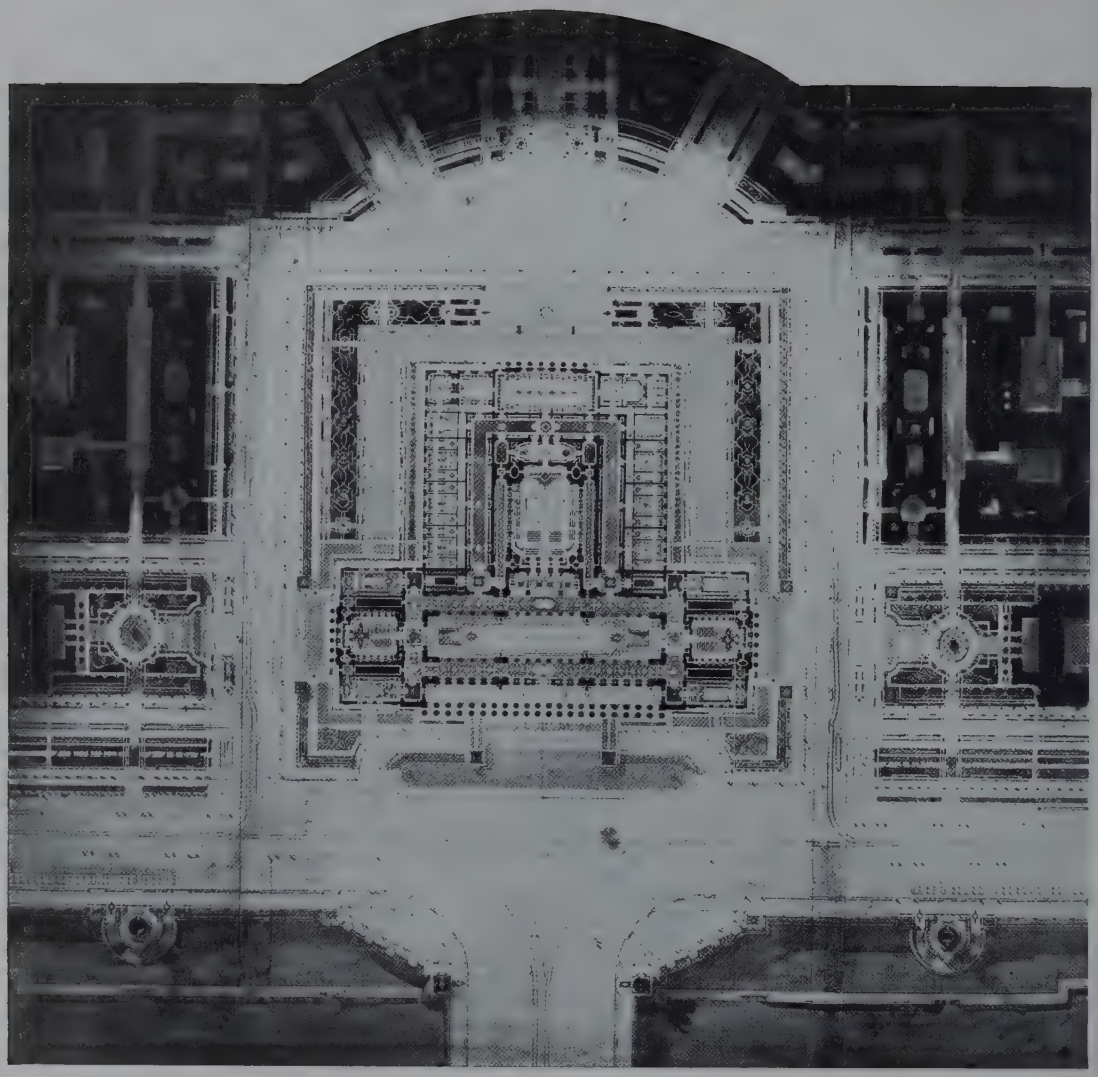


"A City Hall for a Commission Form of Government," by Harry Sternfeld, Paris Prize, 1914. (See elevation, Figure 270)

THE STUDY OF ARCHITECTURAL DESIGN

INTRODUCTION

THE BEAUX-ARTS METHOD

THE system for the study of architectural design conducted by the Beaux-Arts Institute of Design is, of course, founded on that of the Ecole des Beaux Arts in Paris. The scheme of education is similar, and architectural education in this country has been for many years largely under the tutelage of men who have had the training of the Paris school. In transplanting this system to America, its sponsors have interpreted it freely into American ways and it now has certain traditions differing slightly from those of the parent school. But in order to understand the scheme of study one should know something of the "Ecole" itself.

Main Entrance, Ecole des Beaux Arts, Paris.

The Ecole des Beaux Arts was founded in 1671, as a royal academy of architecture, by a minister of King Louis XIV named Colbert, perhaps known best to Americans through the novels of Dumas. Cardinal Mazarin had previously founded an academy of painting and sculpture, and at a later period these two schools were joined.

Since this early beginning the Ecole has slowly formed the tradition that governs its procedure today. The purpose of its training is to impart to each student a *method of attacking and studying any problem in architectural design which may be presented.* It gives a training in composition and design – and the science of design is necessary to the architect in order that he may express himself clearly.

The Ecole is different from any school in this country in several ways, ways that suggest a possible future development here; the growing demand for a governmental department of fine arts may result ultimately in a national school.

In the first place the Ecole is recognized in France as the final school for architectural education. In this country, there is as yet no such authority, and a number of schools claim, and in fact have had by turns, superiority in training, as evidenced by the results of competitions in which men trained in the different schools have entered.

Then, too, the Ecole in Paris is surrounded by notable monuments of architecture, and by galleries filled with the masterpieces of all ages. The whole city is a museum, and within a few hours ride are hundreds of superb buildings, ancient, medieval and modern. England, Spain and Italy are no farther from Paris than is Chicago from New York. Nowhere can be found so complete a set of representative buildings as in Paris. There is no modern architectural program that has not there an excellent translation. If a library, for instance, is the subject of competition, in a few hours the student can visit many libraries and start his work with all the benefits of existing tradition. Several of our schools are fortunate in being near excellent museum collections; but none of them is as yet surrounded by such a wealth of actual architecture, for this is a young country.

Furthermore the school itself is a grouping of fine architecture. The nucleus of this group is the old Convent of Petits Augustins, founded in 1608 by Queen Margaret of Valois, and completed after her death by Queen Marie de Médicis. This convent was suppressed during the Revolution and became

for a while a museum where relics from churches and châteaux were collected. One of these, a portion of the façade of the Château d'Anet, is shown in one of the illustrations on this page. When in 1830 the Ecole took possession, various alterations were made to the buildings to adapt them to their new purpose, and portions have been added from time to time. The Cour du Murier, a view of which is shown, is part of the cloister of the convent. Note the delightful atmosphere of this court, with the fountain, the old trees, and the casts of statues under the arches. Another interesting part of the old convent which remains is the chapel, not illustrated, now containing an exhibition of casts and small objects. Forming a decoration at the end of the room is a copy of the "Last Judgment," painted by Michelangelo in the Sistine Chapel in Rome. A view of the vestibule of the Salle Melpomène is shown. The library is attractive both for the wealth of books and for the architectural beauty of the room in which they are housed. In the court of the library are a number of the archaeological remains that form part of the student's background. The main entrance through the ground court is shown in the illustration on page one.

Entrance to Château D'Anet, Ecole des Beaux Arts, Paris

But most important of all is the method of study at the Ecole, as on this its success depends. The features of this system at the Ecole, as summed up by one of its professors, and quoted by Walter Cook in an article that appeared in the issue of *The Architectural Record* for January, 1901, are: 1. The division into ateliers. 2. The tradition of the older pupils helping the younger. 3. The teaching of design by practicing architects (and we might add here the judgment of the competitions by a trained jury of practicing architects). 4. The beginning of the study of design as soon as the student enters the atelier. 5. The system of the esquisse.

All of these features the Society of Beaux-Arts Architects, composed of former Ecole students, has incorporated in the work of the Beaux-Arts Institute of Design, which can be made use of by any one who is industrious and wishes to study. The individual student in a small town can learn much. Students in the cities where ateliers have been formed in which criticism in design can be had from school trained men and where libraries and museums exist, have an opportunity for the finest kind of architectural training. Also there is always the opportunity for the student to become ultimately a competitor for the Paris prize. The winner of this prize may enter the higher class in the Ecole des Beaux Arts, finish his architectural studies in Paris, and travel in Europe.

The Beaux-Arts Institute of Design has achieved a position of authority in this country in that most of the architectural schools now use its programs, and send their work, in whole or in part, to be judged by its juries in New York City. The knowledge that an award is made on a problem after it has been compared with some hundreds of others, from all parts of the country, makes the rating especially valuable as an indication of the student's progress and makes the award precious if it be one given only for distinguished work—a medal in Class A, or a "first mention placed" in Class B.

The most important thing is for the student to take the work with the right attitude. Any one problem must be considered not as an end in itself, but as a part of a well mapped-out training in design—and design is not concerned primarily with ornamentation or detail, but with making an arrangement that will satisfy the practical requirements, with the composition of elements, with the proportion of

Cour du Murier, Ecole des Beaux Arts, Paris

Hôtel de Chimay, Ecole des Beaux Arts, Paris

Exhibition of Students' Drawings at a Judgment of Work from Ateliers in Various Parts of The Country. The Headquarters of The Beaux-Arts Institute of Design in New York.

masses, with the arrangement and disposition of openings, etc., and with producing a building of pleasing appearance.

If the student can join an existing atelier he should by all means do so. If there is none near, he should try to persuade some other draftsmen, as many as possible, to take up the work at the same time; discussion of the problems during the course is of great value in spurring one's own efforts and stimulating one's imagination.

In an atelier one of the causes for the rapid development of the new student is the tradition already mentioned as one of the features of the Ecole system—the older, more advanced pupils helping the younger; and what goes with it, the younger men working for the older. This latter is called "niggering" and consists in doing anything the advanced man asks—usually taking a study from a small scale to a larger, "rubbing" a drawing, inking-in, laying out mechanical work, etc., even scraping off the remains of an old "stretch" on a drawing board. It is in return for this that the older man gives criticisms to the younger, shows him how to better his problem, tells him of documents that fit his case, gives him a lift with his rendering and in other ways helps him to develop quickly in all those things that are learned from experience.

Vestibule of the Salle Melpomène, Ecole des Beaux Arts, Paris.

It is hard for a new man to realize that working on some one else's problem is doing him as much good as working on his own, and that if it is on the problem of a more advanced man it is of *more* value than working on his own problem, to say nothing of the guidance and help he gets in return.

This spirit of give-and-take is the finest thing in the atelier; a man will soon learn that the success of the atelier is the success of each man in it.

If the student has to work alone, he should ask some practicing architect to criticize his work, preferably a man who has been trained by the Beaux-Arts method either in Paris or in this country.

One of the features of the system mentioned — the method of the esquisse — will be gone into in the first chapter, when we will start our work by taking a sample esquisse.

Analytique, "A Pavilion in a Park," by Harry A. Gnerre, Atelier Hirons-Morgan.

"The Antique City of Veïes, in Etruria," Rendering in Tempera, By Jacques Carlu.

Size of original 24" x 42".

FOREWORD

THE ANALYTIQUE

MOST sincere must be the admiration of every old Ecole man for the excellent methodical way by which, in the following pages, the author explains to the beginner the successive steps he should take to produce a good *analytique rendu*. As he sets them forth everything seems as clear as day, and we, to whom these details recall our bunglings of years ago, must heave a sigh to think that the student of today is thus to be spared the making of so many mistakes and may so much more rapidly overcome the first difficulties of architectural design.

Mr. Harbeson has certainly "doped" out his subject very well; his "dope" is of the best and will be of great help to all who study it attentively, from his hints about the making of the esquisse, through his time schedule, to his composition of the sheet and the final rendering.

But in this country we are too fond of "dope"; we love to be instructed *how* to do things—and the short-cut way, too; we would that mastery of every profession could reach us through definite progressive steps, mechanically, with a minimum of our own brain work, as we have seen a Ford car assume form through successive additions to an infinitesimal beginning.

The danger is there: Bernard Shaw has said somewhere that the things we are taught we never learn, and for this reason I would counsel the reader of the following pages especially to read between the lines. Take, for instance, the article on the composition of the sheet: its purpose is not to say, arrange your detail so, put a balustrade across the lower part of the paper, place your façade above it, and that is all you have to think about. Far from it, its purpose is, by giving a few examples of good and a few of bad solutions to stimulate the student to search and to learn for himself such variations in the fundamental principles of composition as may be most sympathetic to him, and may give his work that personality which is the basis of all style.

And so on with every step in the method which is here so lucidly expressed; to further elaborate what I mean would be unnecessary and tedious and would, besides, be the negation of our intent, for we would be *teaching* the reader what is in his book at the risk of his not *learning* it!

But a word about the purpose of the analytique, from one who seems fated ever to be on its jury, is perhaps not out of place here: this elementary test is not imposed as a penance, as so many drawings received would indicate it is too often considered; its purpose is to insure that a student, before he enters the veritable study of architecture, has at his command a certain knowledge of the things necessary to express acceptably a proposed edifice. These analytiques, in their rather naïve form, furnish the fields to convey much artistic subtlety or to betray the depths of Philistinism, and the gamut which nearly every exhibition shows between the two extremes reflects every grade of talent. In these drawings can be seen sensibility to proportion, feeling for composition, character in drawing, appreciation of ornament, and knowledge of descriptive geometry in projections and in shades and shadows. And it is quite generally on these lines that the drawings are judged, the jury preferring to leave to more technical problems the questions of architectural fitness and special character.

New York, 1922. LLOYD WARREN.

Figure 1. Analytique, "A Colonnade," John O. Vegezzi, Atelier Corbett.

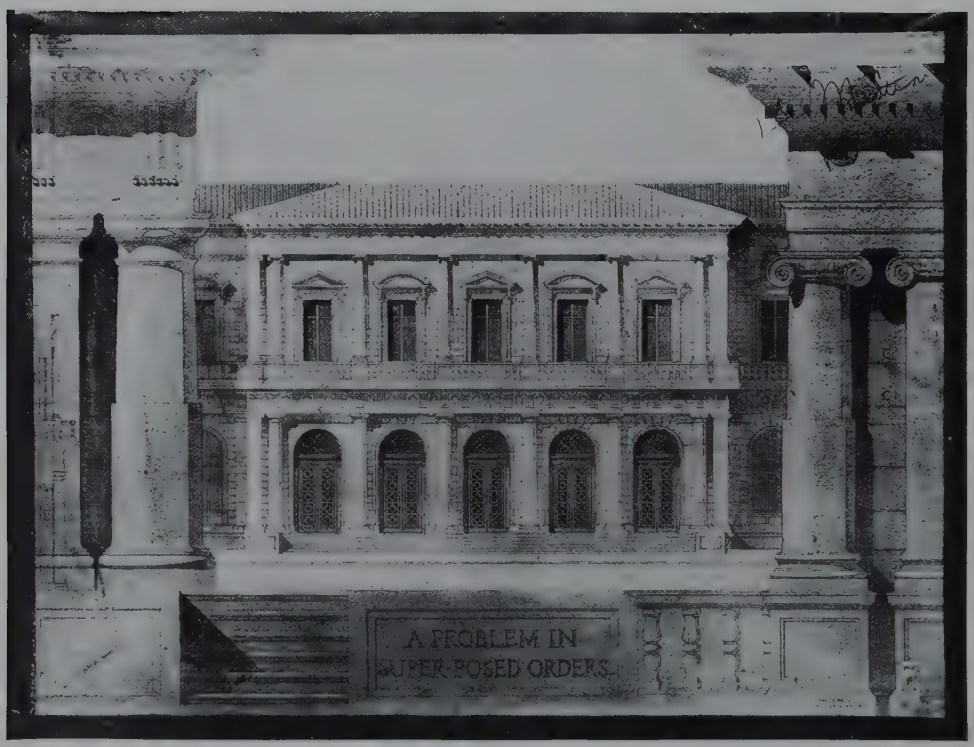


Figure 2. Analytique, "A Problem in Super-Posed Orders," T. A. Price, Atelier Wynkoop.

THE "ANALYTIQUE" OR ORDER PROBLEM

Chapter I

TAKING THE ESQUISSE

HAVING joined an atelier, or if no atelier is at hand having sent for the "circular of information"* and arranged with some practicing architect to conduct the exercise of taking the esquisse, let us take this first step in our first problem, an "analytique." The analytique is a study in proportion, and in the elements of architecture—the treatment of walls, doorways, windows, cornices, balustrades, porticos, arcades, etc., and usually requires the use of a particular one of the so-called "five orders of architecture." Sometimes the choice of the order is left to the student.

These problems may be very interesting as one can see from the illustrations. Figure 1, for instance, required two treatments for a colonnade, connecting two wings of a building, one to carry a passage at the second floor level and one at the third. A problem of this kind has frequently arisen in an office where a large building is being designed, and studies are made before it is determined at which level such a passage shall be built.

Figure 2 is a study in super-posed orders. Figure 7 is quite different, the treatment of a niche in a garden wall. Figure 8 is also a piece of garden architecture, "A Temple of Love." Different in character from all of these are other problems, for instance, "A Doorway," Figure 9, "A Mausoleum," Figure 104, etc. You will note that the problems are quite varied in subject matter and presentation—especially in the composition and treatment of the frame of details at large scale, usually required for an analytique. Of this we shall have more to say later. At present we are to take the first step, which is to make an "esquisse."

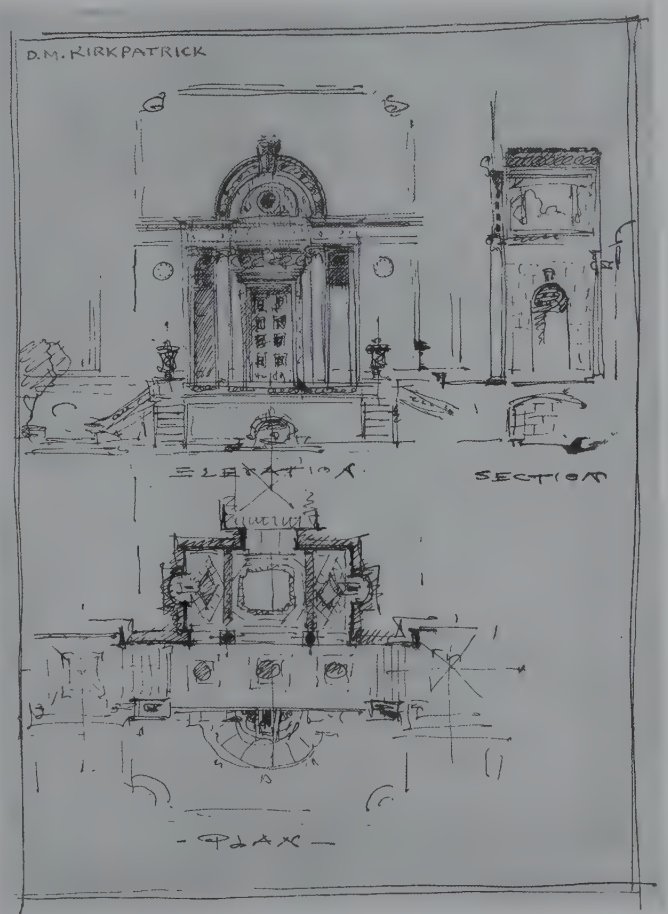


Figure 3. Esquisse, by Donald M. Kirkpatrick, for "A Loggia." Showing the technique of a Paris Prize Winner.

Esquisse is the French word for sketch. It is used in the ateliers, however, in a specific sense and means a preliminary sketch showing the main ideas of a student's solution of a problem outlined in a program. It is done in a short and fixed time, usually nine hours, and is made "en loge." This means literally "in a box" or booth, and in Paris there are booths provided for this purpose; but the spirit of this requirement is that the student shall make his sketch without the aid of books or advice.

* *Information in regard to existing schools and the organization of new ateliers, the "circular of information" mentioned in this chapter, and other information can be had by writing to the Chairman of the Committee on Architecture, Beaux-Arts Institute of Design, 126 East 75th Street, New York, N. Y.*

Figure 4. Showing a number of different ideas for a single problem in the Analytique.

A copy of this sketch is sent to the office of the Institute at New York, and the student must conform to the main features of this sketch under penalty of having his work "thrown out" by the jury.

Since the student's finished projet will be founded on his esquisse, the importance of the latter can hardly be over-estimated.

The value of the esquisse from the point of view of mental discipline is very great. The discipline of working on a problem on which one is tied down to an esquisse is as strong and as persistent a corrective as there can be against vague and loose thinking.

One of the chief objects of the Beaux-Arts method is to teach a man to confine his efforts to a well-defined channel. The finishing of the projet, the passing to ink, rendering, titles and borders are only supplementary to this and are, if anything, of even less importance than the fact that the student has been obliged to make his point of view precise at an early stage of the study of the problem.

In actual practice architectural problems are circumscribed by definite conditions, limitations of cost, peculiarities of site or of the client, etc. The esquisse takes the place of these limitations in the class room. Moreover, it does much to insure some measure of originality. When several men are working together on the same problem, the strongest, and there usually is such a one, will sway the others by example; or one with a ready tongue will argue well his point of view. Were it not for the esquisse all would follow the lead of the clever student, and the problems as presented would be uninterestingly alike. Even with the esquisse there is frequently a distinct family resemblance in the work of a group.

Let us make an esquisse for the first analytique problem given in the year 1920-21. The course of procedure is similar for any problem. The program was as follows:

CLASS "B"--I. ANALYTIQUE.

"The Side Entrance to a Church."

A Catholic Church, situated on a plot bounded by four public streets, has been left with its side elevations unfinished, due to the lack of necessary funds at the time of the original construction. The architecture of the church as it stands is Renaissance, and it is now proposed to finish the exterior of the right transept wall and transept entrance. The latter is the subject of this Program.

The problem requires the study of an architectural composition, complete in itself, of solemn dignity, and properly accentuating the secondary entrance against the transept wall. The door opening shall be 8'–0" in width, which is the sole limitation of the problem. Such a door is usually treated with the ordinary classic elements, that is to say, columns, pilasters, pediments, niches, statuary, etc. In this problem the development of the motive is left entirely to the discretion of the student, save that account should be taken of the architectural treatment of the transept as a whole. Examples of such entrances occur in nearly all of the Renaissance churches in Italy and France.

REQUIRED FOR THE ESQUISSE: *An elevation, section and plan of the entrance motive, all at the scale of ⅛" to the foot.*

REQUIRED FOR THE PROJET RENDU: *The same drawings at the scale of ½" to the foot. Details of interest at not less than 1½" to the foot. (Note—Esquisse shall be signed in Print Letters in the upper left hand corner, with the name of the Atelier or Patron drawn in ink on a single sheet of tracing paper, cut to the size of 8½" x 11", with a single line border. The title and subject of the competition should also be noted on the esquisse.)*

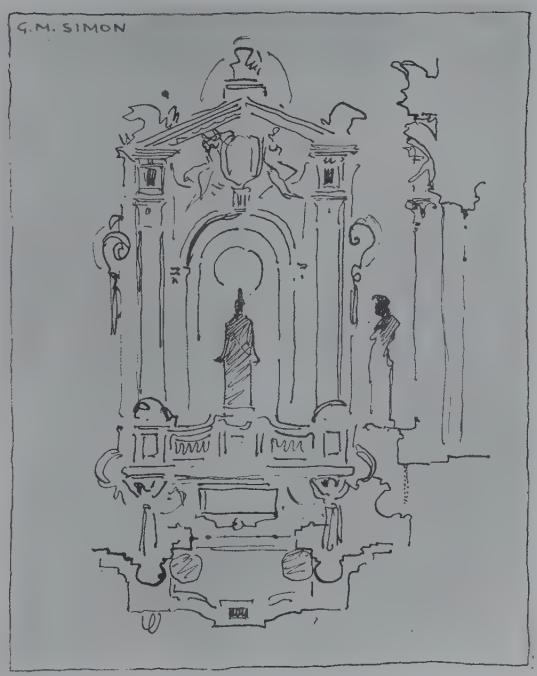


Figure 5. Esquisse, by Grant M. Simon, "A Window with a Balcony." Showing the technique of a Paris Prize winner.

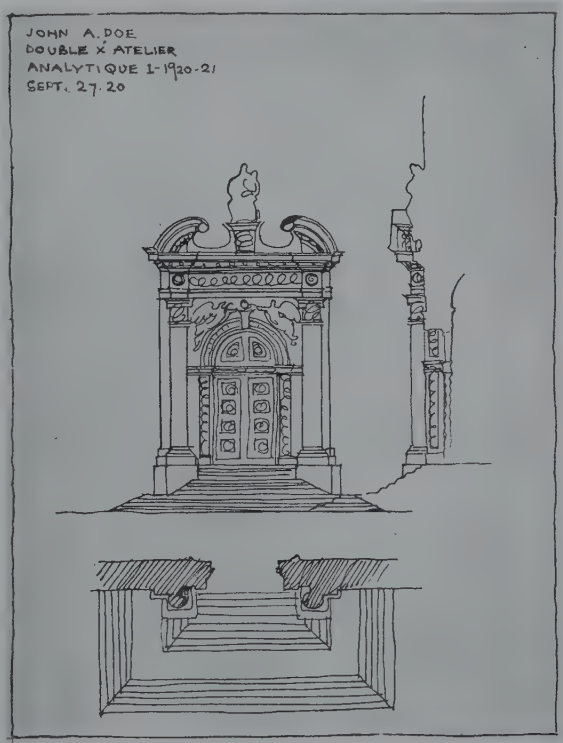


Figure 6.
Esquisse made from last sketch shown in Figure 4.

The logical way to approach the problem is to put down first a list of what the program requires: 1 – A religious character. 2–Architecture should be Renaissance. 3–The door is a secondary entrance, not the principal one. 4–The only fixed size is the width of the door opening.

It is well to note also what is left to the choice of the student, not only the details mentioned in the program, but also that he is at liberty to consider the church a large or a small one, that the door may be a square or round headed one and that the Renaissance character called for could be that of the Italian, French, Spanish or English Renaissance.

The scale at which the esquisse is called for is small, so we may as well start directly at that scale and lay off eight feet, and put down as many different solutions of the problem as we can think of. The door may be round-headed and surrounded by the square motive of pilasters and entablature. Or it may be square-headed, and contained within an arch treatment. It may have pilasters at the side, or engaged columns, or columns standing free; or these elements may be doubled at either

Figure 7. Analytique, Central Motive for a Garden Wall, L. Licht. Atelier Licht.

Figure 8. Analytique, "A Temple of Love," G. Roth, Colorado University.

side; or there may be a column and a pilaster at each side. There are various treatments of cornice possible, and different arrangements above the cornice—whether pediment or attic, or sculptural treatment, or even nothing at all.

Figure 4 shows a number of different ideas that would answer the program. There are many other possible combinations, of course, but a beginner probably would not think of a greater number of variations, though each man's efforts would show a different assortment of ideas.

In this case a line was drawn across the paper marking the bottom of the doorway, the width of door was laid off, and the sketches were made, extending above and below this line. After the first is drawn, time is gained by making the others over it, on tracing paper, thus avoiding the necessity of repeating the laying-off of dimensions. A rough sketch of plan is usually worth the trouble of making it, as it shows up faults of design not seen in elevation. A human figure jotted down to scale, say six feet high, is of value in visualizing scale. Indicating the conventional shadows will help to show projections.

The important thing at this time is not to settle on any one idea, nor to think of the merit of any one idea, but to indicate as many different solutions of the problem as possible.

Having arrived at this stage, it is well to re-read the program to see that no specification has been overlooked that would have an influence on the solution, and then to eliminate from the different ideas those that are least interesting, or least satisfying. In making an esquisse for more advanced work this operation of passing judgment on one's own work becomes very important.

Having finally decided which of the solutions is most satisfying to his own mind, the student should spend the rest of his time in "studying" it, using tracing paper, and making rapid drawings, one over the other, of changes in proportion and arrangement, and at this time the plan and section should be drawn and studied for the general outline of projections and reveals.

Now we are ready to draw the esquisse itself. This is also done on tracing paper, and, as it is usually the size of the sheet on which the program is printed, the size can be laid out by simply placing the tracing paper over the program, drawing at the same time the single line border required.

This sheet can now be placed over the last study of the selected scheme, which is then traced to show all the essentials, but no details. Figure 6, page 9, is such an esquisse made over the last sketch in Figure 4. Note that the ornament is indicated only, and that in a conventional manner, showing a "gray" tone. The caps of the columns are indicated in similar fashion, so that when the student starts to study his problem he is free to choose among any of the Corinthian or Composite types. The paneling in the door, and the sculpture, are merely suggested.

But certain things are absolutely fixed. In working from this esquisse the student would have to have his doorway enclosed with a semi-circular form; that, in turn, surrounded by engaged columns supporting an entablature with a broken pediment, with some sculptural form between. The return of the cornice at each side of each column is also clearly indicated and could not later be omitted.

A word or two should be said here as to the draftsmanship used in the esquisse. It should be neat and workmanlike, and should not attempt to cover an indecision on the part of the maker as to two different schemes, leaving him free to choose which he wishes to do. Such an esquisse, or a careless esquisse, may cause a problem to be thrown out by the jury, just as will a change from esquisse.

In Figures 3 and 5 are shown esquisses for analytiques made by Paris Prize winners. The first was done by Donald M. Kirkpatrick (Paris Prize, 1912) for "A Loggia," and the other by Grant M. Simon (Paris Prize, 1913) for "A Window with a Balcony." Figure 17, the esquisse for a "Marine Museum," by Roger Expert, shows the technique of a winner of the "Prix de Rome" at the Ecole des Beaux Arts in Paris, usually considered the highest student honor it is possible to win in that school, and open only to Frenchmen.

Having made this esquisse the student is now ready to prepare for his first criticism.

Figure 9. Analytique, "A Doorway," Wm. Ullrich, Atelier Hirons.

Figure 10. Analytique, "A Pavilion in a Public Place," Fred W. Hauptle, T-Square Club Atelier.

THE "ANALYTIQUE" OR ORDER PROBLEM

Chapter II

PREPARING FOR THE FIRST CRITICISM AND LAYING OUT THE SCHEDULE

IN beginning the study of your analytique there are two steps to be taken. One is to prepare for your first criticism; and the other is to lay out a schedule for the problem, disposing of the time at hand. The esquisse is taken on a Saturday, and the next day or two are usually spent in thinking over the problem and visualizing one's ideas about it, rather than in actual drawing. We may consider the time schedule first as being properly a part of this analysis.

For the first problems, this time disposal must be consciously—and conscientiously—done. Later it will become a sub-conscious process, revived, most likely, for any prize competition or scholarship problem. To really learn the lesson of planned disposal of time is of the greatest value not only in projet work in the atelier, but in office practice, either for competitions, or where a client has fixed a date by which a set of drawings must be completed.

The character of the problem will make a great difference in the way the time is apportioned. For instance, where the "parti" or solution is given in the program (such as "A Circular Temple of Love" of doubled columns), the work should be advanced rapidly to final scale, and the time spent on the study of profile, detail and presentation. And the time allotted to the problem by the Calendar of programs of the Beaux-Arts Institute of Design will naturally make a difference. Let us take as an example an analytique for which five weeks are allowed—esquisse called for at $\frac{1}{8}$" scale, and final drawings at $\frac{3}{4}$" scale, with the usual details at larger scale. We visualize the time best by putting down the calendar days in a table—one under the other as in Figure 12. Then we can start at both ends of this table. The problem begins with a $\frac{1}{8}$" scale esquisse, so that the study logically begins there, and we end with the rendering, which requires a certain time. (By the *end* of the first problem we shall have a better idea of how much time is required for that.) From the ends we work into the middle of the table and dispose of the remaining time. Such a chart would look like Figure 12.

If the time is longer—sometimes six weeks are given—the extra time may be divided all along the line, or added entirely to that portion where the student knows he is weak (for the chart will vary with each student's ability and experience).

Figure 11.
Study, "Decorative Treatment of a Wall Fountain to End a Vista."

Possibly more time may be given over to the rendering in order that India ink may be used. Rendering in this medium is of necessity slow because an India ink wash cannot easily be lightened or removed to make alterations. Furthermore, the washes do not take their final value until they are completely dry.

It should also be explained that this schedule has in mind the atelier man, who, because he can devote only evenings to the work during the week, finds his most effective working

Nov. - 1 Sat. ← Esquisse,
2
3 Start Studies at 1/8" Scale
4
5
6
7
8 Sat. ← Take drawings to 1/4" scale and make
9 thumb sketches of frame arrangement or
10 composition on sheet.
11
12
13
14
15 Sat. ← Take drawings to final scale-3/4", and
16 after getting first criticism at this
17 scale, start to lay out details at
18 large size called for.
19
20
21
22 Sat. ← All small-scale drawings 3/4", should
23 now be in final shape, time being spent
24 on moulding profiles and "character" in
25 ornament. Block out sheet arrangement
26 with charcoal on tracing paper.
27 ←——— Start final drawings.
28
29 Sat.
30
31 ←——— Start inking final drawings.
Dec. 1
2
3
4 ←——— Cast shadows.
5 Sat. Render
6 "
7 Mon. Problem due 10 A.M.

Figure 12. Time Schedule for Analytique for which five weeks are allowed.

Nov. - 1 Sat. ← Esquisse
2
3 ←——— Start studies at 1/8" scale
4
5
6 ←——— Take drawings to 1/4" scale, make small
7 sketches of sheet arrangement.
8 Sat.
9
10 ←——— Take drawings to final scale.
11
12 ←——— Lay out details at large scale and
13 make sheet composition.
14
15 Sat. ← Start final drawings.
16
17
18 ←——— Start inking final drawings.
19
20
21 ←——— Cast shadows.
22 Sat. Render
23 "
24 Mon. Problem due 10 A.M.

Figure 13. Time Schedule for problem to be completed in three weeks.

time on Saturday afternoon and Sunday. The time should be rearranged slightly for the man at college, with part of every day at his disposal, but the principle is equally good in his case.

Figure 13 is a time schedule for a three-week problem, given for comparison with Figure 12. It will be seen that the rendering must be given as much time, final drawings almost as much; the difference comes mostly in the body of the problem—in the time spent in what we call "studying" it. It will be well to remember that when the time is limited, studies should be kept at a small scale until everything excepting detail of ornament is determined. *A drawing at 1/2 inch scale is four times as large in area as one at 1/4 inch scale.* If you are held back in the early part of your problem, because of illness or for any other reason, the schedule for the time remaining should be recast, and allotted just as it would be for a problem of shorter duration.

Figure 14.
Study for "A Window with a Balcony."

Let us now prepare for the criticism. When your critic comes for the first time you should be ready to show him something more than the esquisse, as that is somewhat conventionalized, and is purposely not too definite. The value of this first criticism is *to have the main proportions of your solution corrected.* Therefore, your first studies should aim to show these proportions in as striking a manner as possible.

For that reason it is good to blacken in your openings — doors and windows. The actual door and glass divisions are properly studied later—at present they would only confuse. For the same reason all shadows should be cast to give the "relief" of projecting members. The *detail* of profiles is not important now; in indicating cornices, etc., what is important is to have the proper projection of the principal members — i.e., those that cast shadow—and it would be a waste of time to bother with ornament or careful drawing of figures, vases, etc. The idea is to determine, at this small scale, when it is most visible, what is good proportion between openings and wall — voids and solids—between masses in projection and in retreat, between features, and between all of these elements when related to each other.

In all of these studies a human figure, drawn to proper scale, should be shown. It is indispensable as a standard of "scale," and is of great use in showing proper sizes for steps, balustrades, benches, etc.

The analytique problem frequently being described in terms of elevation, you should keep clearly in mind, whether you draw them at this time or not, what plan and section you are working with. For the convenience of your critic it is better to draw them — and, on this first study, best to draw them on the same sheet as the elevation. The plan and section should be blackened in to get the proportion of masses, the extent of projections and reveals.

Figure 15. Study for "A Semi-Circular Portico."

The illustrations in the text show several studies as prepared for a first criticism. Figure 11 is a "Decorative Treatment of

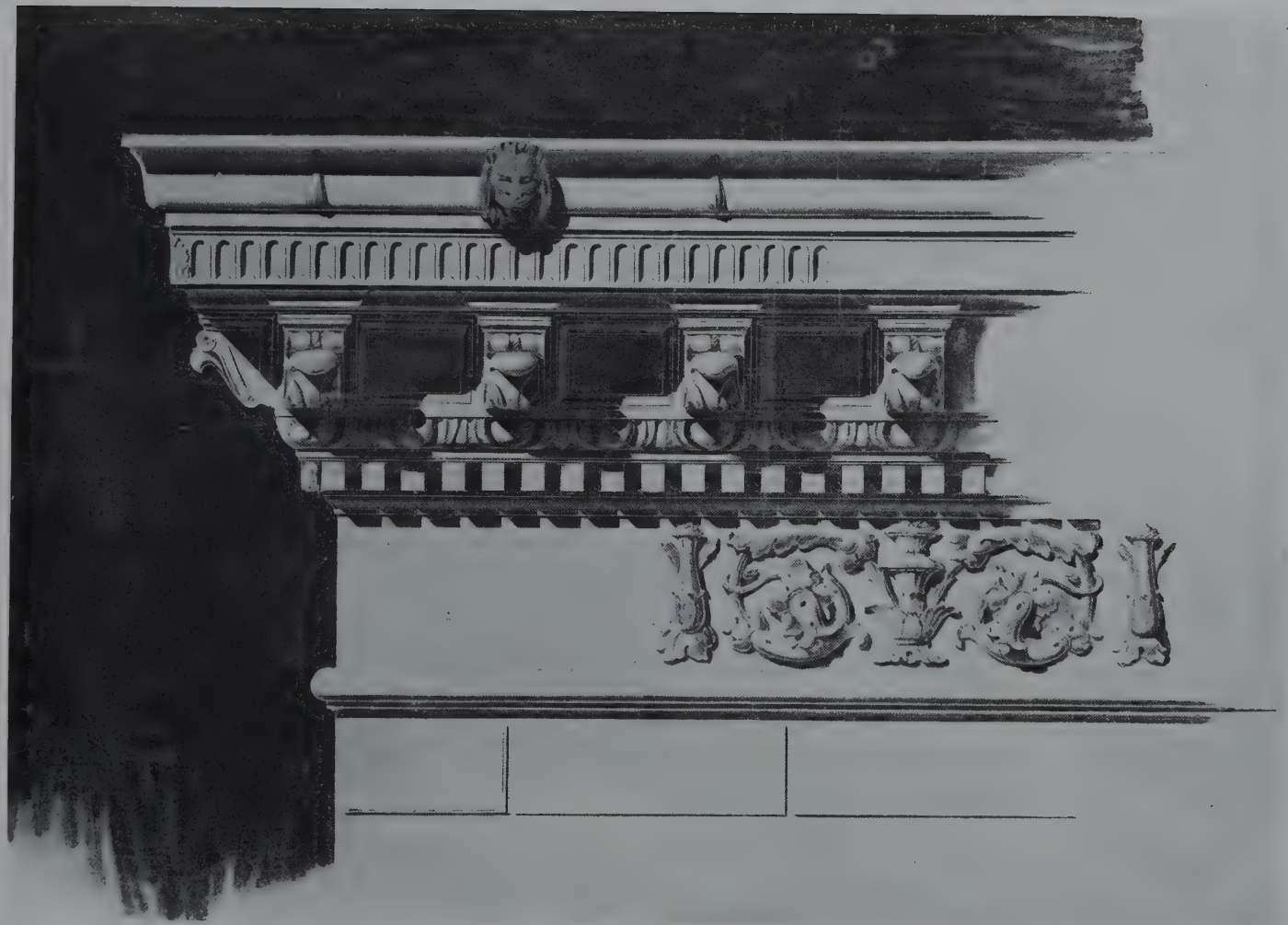


Figure 16. Charcoal Study by Schell Lewis of Detail for the Leader Building, Cleveland, O. Charles A. Platt, Architect. This drawing, and the one shown in Figure 18, were made for the purpose of studying the detail in the process of designing, and not for presentation.

a Wall Fountain to End a Vista." As the program stated the silhouette of such a structure to be of first importance, the sky is blackened to show this silhouette. Note that the shadows are cast; that the sculptural figures are only indicated roughly, all that is necessary being to show as clearly as possible to your critic the size and direction of mass intended.

Figure 14 is for a "Window with a Balcony." The shadows of the cornice and brackets of the balcony, and of the frame on the window, show the scheme completely. Here the window is darkened, and the shadow on the window is shown still darker. If the problem were of a larger motive, at a smaller scale, and containing a number of openings, these would simply be blackened in at this stage, and the amount of reveal, as indicated by the shadow of the frame on the window, would properly be studied after the size and shape of the openings, and the relation of these openings to the wall surface, had been determined.

Figure 15 is "A Semi-Circular Portico." Here the space between the columns is blackened in; openings in the wall behind would be studied after the intercolumniation had been settled.

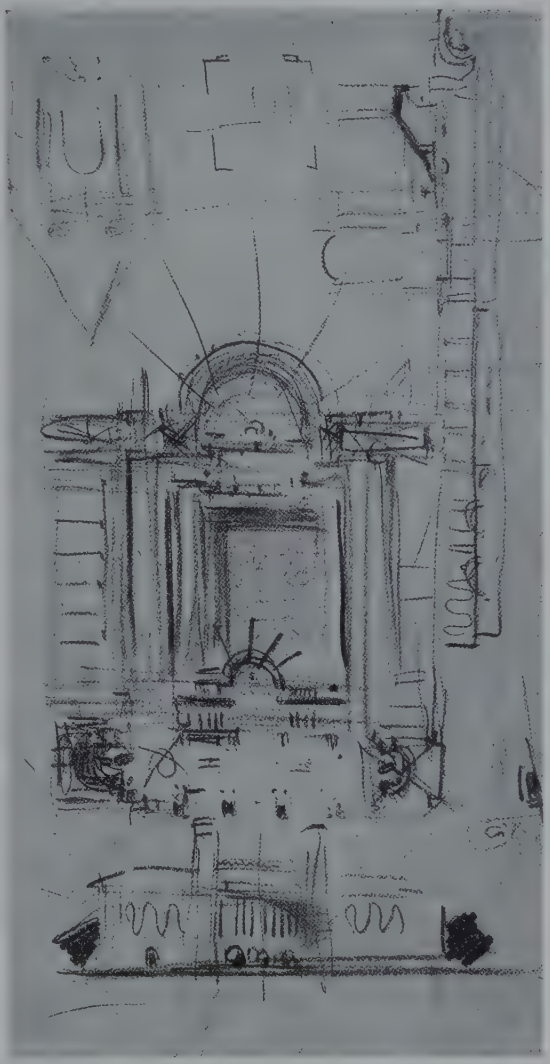


Figure 17. Esquisse for a "Marine Museum," by Roger Expert, showing the technique of a winner of the "Prix de Rome" at the Ecole des Beaux Arts, Paris.

Note that in all these drawings the detail of cap and cornice is left until the proportions of masses have been studied and that ornament is shown only as a conventional "gray." Generally speaking, it is well to make the first studies at the scale of the esquisse. If time is short, or the final drawings required are at an unusually large scale, start directly at a scale twice the size of the esquisse.

Try in these first sketches—it is better to make several—to express your ideas fully to your critic. He wants to develop *your* ideas, not his own; and he would like to correct, at the start, any ideas that you may have that are fundamentally wrong. So, beginning with the esquisse, develop your ideas of the problem as much as possible before you place your work before him. You will be better able to make use of his criticism, and you will *develop your own initiative;* he can only help to develop your knowledge of design and proportion and your sense of taste.

And one word more: when he comes to criticize, in order that his mind may not be diverted from consideration of your problem by petty discomforts, it is well to see that you have:

One study tacked down on a board—if it is over an old drawing put a piece of opaque paper between them—all shadows cast; openings blackened in; plan and section at hand, or profile of important parts indicated on elevation. A human figure, drawn to scale, 5 ft., 6 in. or 6 ft. high. A roll of tracing paper of convenient size—or several sheets of convenient size; a sharpened pencil or two (not too hard), a scale, and a soft rubber.

This thoughtfulness on your part will make the short time he spends with you of much greater value to you. The critic, whether he is conscious of it or not, *will* help most him who helps himself most. If he finds tracing paper, pencil and rubber at hand, his mind is free to think only of the drawing before him, of its proportions and its possibilities.

It is sometimes hard to make a student realize that these questions of the comfort of the critic have such a close relation to the success of his problem. A man who is a good architectural critic is apt to be temperamental—most talented people are. A temperamental man is not always at his best—his moods fluctuate, and so does his efficiency, as his spirit is buoyant or depressed. Consequently a criticism is not a mathematical thing, always the same, like tutoring in French or algebra, but may be of more or less value to the student, depending upon the mood of the moment. For this reason it is well always to prepare things for the comfort of your critic. If you do so, you will get from him the best criticism that it is possible for him to give at that time.

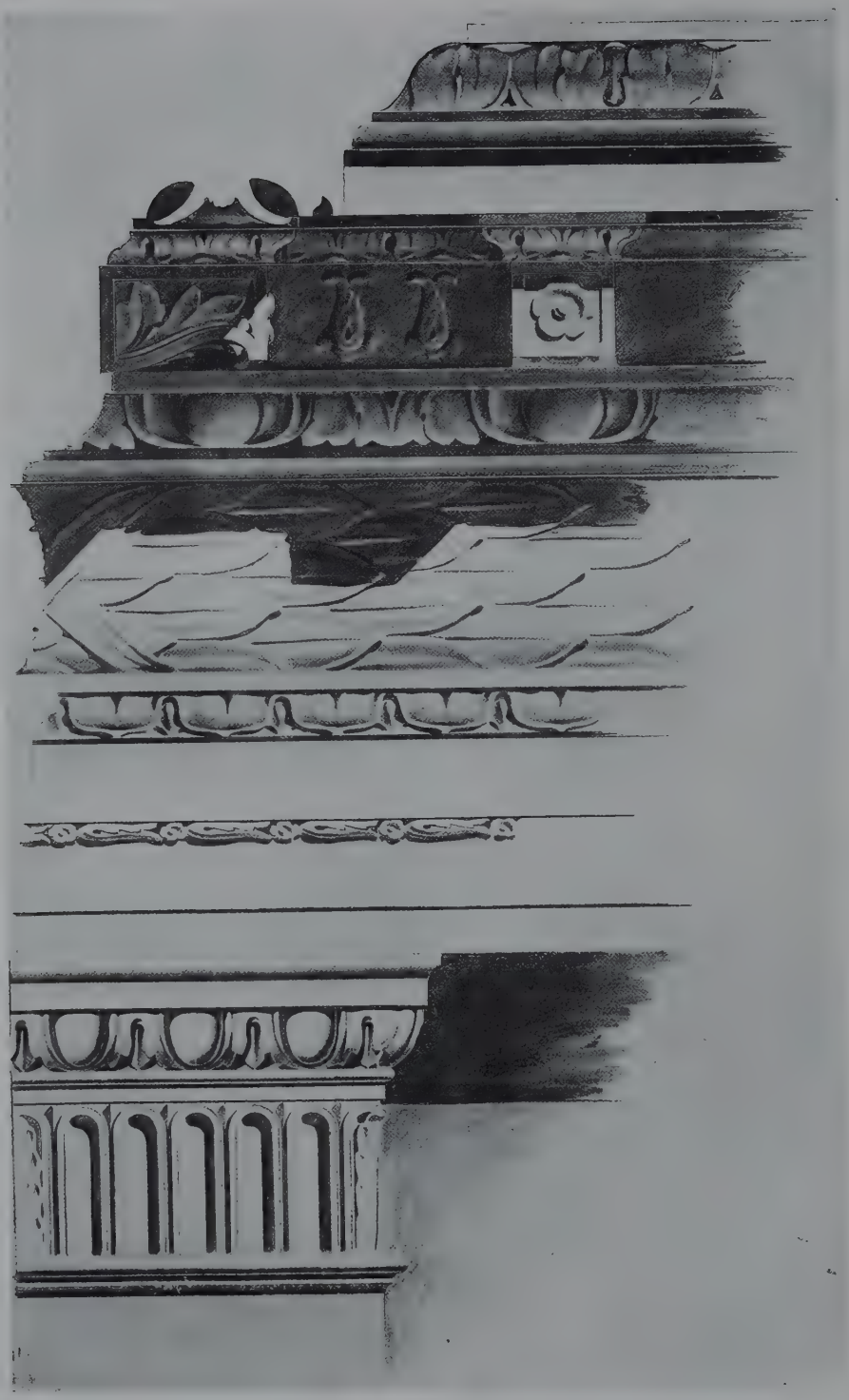


Figure 18. Charcoal Study of Detail by Schell Lewis for portion of an Interior. Charles A. Platt, Architect.

THE "ANALYTIQUE" OR ORDER PROBLEM

Chapter III

STUDYING THE PROBLEM

THAT portion of the development of the problem which we call "studying" it—everything between the taking of the esquisse and the "rendu," or final presentation—is not done "under pressure," as are the beginning and end of the problem, and consequently does not have the same glamor about it; but on this working-up process depends in large measure the advancement of the student in real knowledge. He should not forget that he is pitting his ability against others and that failure cannot be tolerated if he has chosen Architecture for his career. He is his own master, and must take whatever blame is attached to lack of success, if he has not made use of his time, of his critic's assistance, of available books, and other documents. The critic is a sort of older brother who, with his larger experience, will help the student to develop his ideas, who will point out interesting and pertinent examples in history, cheer him in times of discouragement, show him how to better his draftsmanship, and how to enlarge his vocabulary of architectural forms. The student's progress depends mainly, however, on himself—on his application to his work, his intelligence in studying documents, his willingness to make the most of his critic's advice.

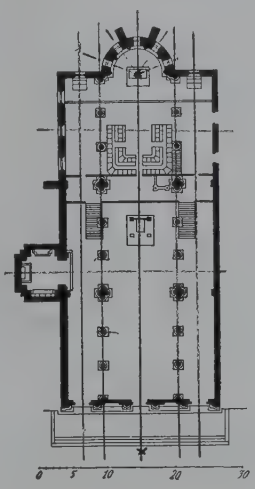


Figure 19. Plan

In the first place the student must understand that while the esquisse is made freehand, and freehand sketches are constantly made during the working-up of the problem, this working-up will depend for its value mainly on "architectural drawing." This architectural drawing is geometrical drawing, and must therefore be exact. As we judge proportions from these drawings, they would have no value unless they were exact.

The means for the logical study of a problem are the several "projections"— plans, sections, elevations; and this is the logical order for their consideration. These projections, typifying as they do different aspects of the same object, make of geometrical drawing a work of intelligence as well as an exercise of eye and hand.

The drawings are made at an established "scale." Studies should be made at a scale that has some relation to the scale of the final drawings, so that the progress from start to finish of a problem can easily be made by doubling measurements in going from one scale to the next larger, or, if necessary, by multiplying measurements by three or by four.

A great aid to rapid and accurate architectural drawing is the practice of laying down an axis through every symmetrical form and working to these axes as the basis of the drawing. All architectural drawing should be done "by the axes." Guadet, in his "Eléments et Théorie de l'Architecture," a publication of the lectures formerly given by him at the Ecole des Beaux Arts in Paris, held this to be of the greatest importance, and we may well refer to his treatment of the subject.

In geometry the axis is the line that separates a plane symmetrical figure in two equal parts; or the line of the poles in a surface of revolution such as a cone or cylinder. In architectural drawing the idea of the axis is larger—it is extended to mean the whole of *a vertical plane separating two halves of a symmetrical structure,* and though drawn as a simple straight line on any one projection, this line is really the *front edge of a plane.* Guadet takes, for example, a church. In considering the plan, Figure 19, the straight line dividing this plan in two is the projection of the vertical plane cutting the church in two —the axis of the

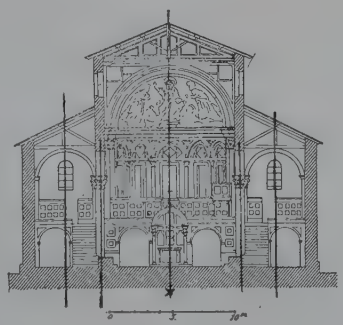


Figure 20. Transverse Section.

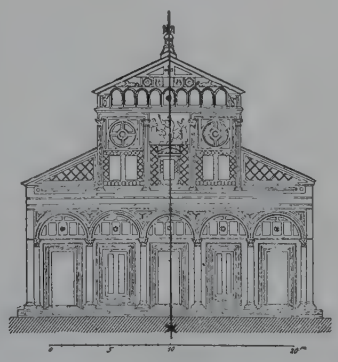


Figure 21. Façade.

Church of San Miniato, Florence.
From Guadet's "Eléments et Théorie de l'Architecture."

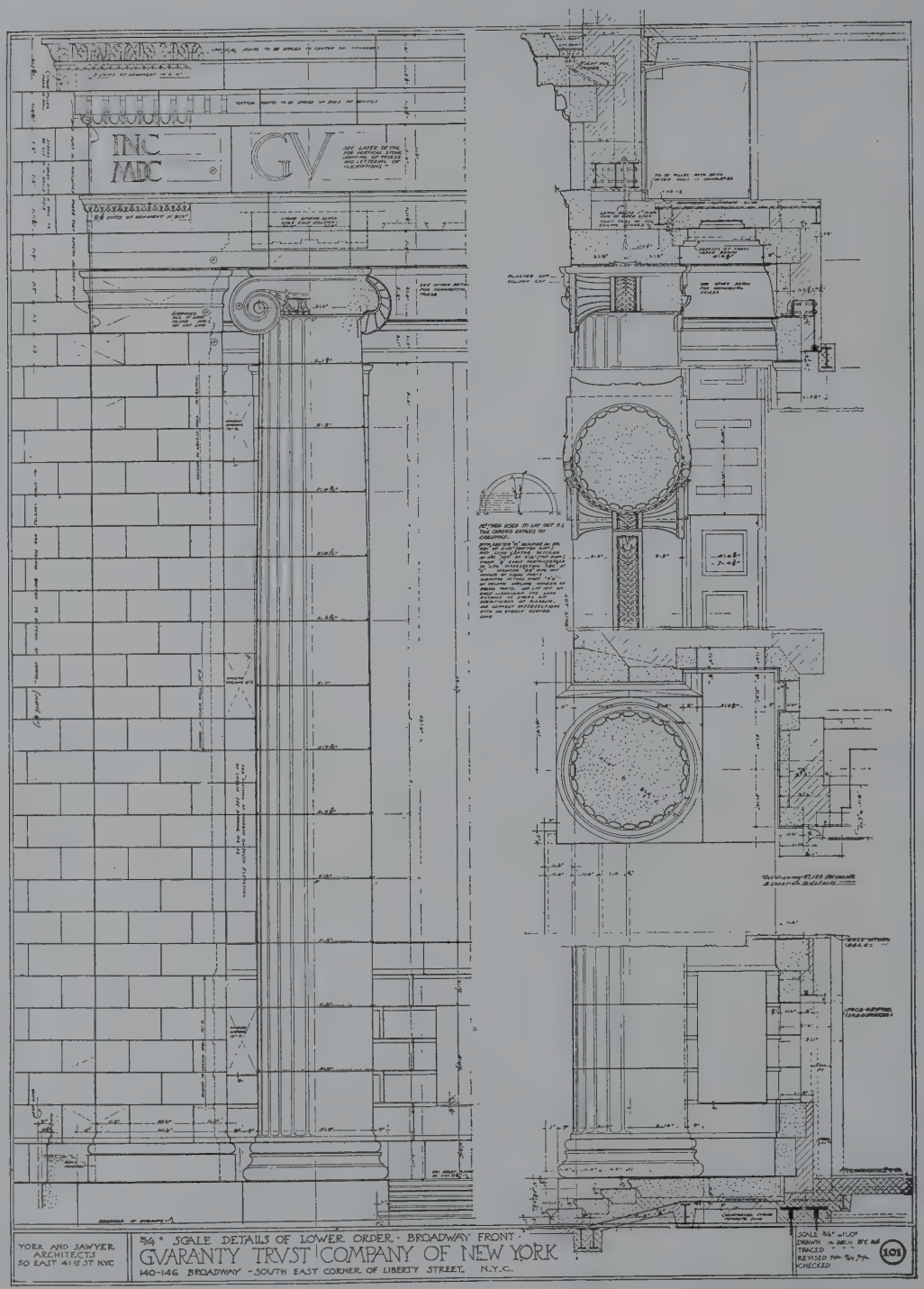

YORK AND SAWYER
ARCHITECTS
50 EAST 41 ST ST NYC
3/4" SCALE DETAILS OF LOWER ORDER - BROADWAY FRONT -
GUARANTY TRUST COMPANY OF NEW YORK
140-146 BROADWAY - SOUTH EAST CORNER OF LIBERTY STREET, N.Y.C.
101

Figure 22. Details of Lower Order, Broadway Front, Building for The Guaranty Trust Company. 140 Broadway, New York. York & Sawyer, Architects.

building; one could say that the kingposts in the roof-trusses, the cross on the ciborium over the altar, the eagle on the pediment of the façade and the center of the window at the back of the apse are "in the axis" of the church; and if you draw the elevation, or the rear elevation, or the transverse section, *the axis in each case is but the trace, in each drawing, of the same vertical plane —the "principal axis."* See Figures 19, 20, 21.

In addition there are other axes: parallel to this one at either side are the axes of the side aisles, and between these and the principal axis, the axes of the lines of piers. And cutting across these are the axes of the transept, those of each bay, the radiating axes of the chapels, etc. If you are to draw such a plan, it is by first laying down these axes with precision that you will succeed in *constructing* your plan. A church is a large problem: the principle is just as true for a problem of any size —in *an architectural drawing you must proceed by the axes.*

Guadet gives as further examples the indication of the manner in which the plan and two sections of the vestibule of the Hôtel des Monnaies, Paris, should be drawn, numbering the axes in the order in which they should be put down. Figures 23, 24, 25. In the case of the plan there are two sets of figures, the axes at right angles to each other being considered separately. Note that the axes 7, fixing the rows of columns, are laid off on either side of the axes 3. The columns are *not drawn first* and the axis of the passage found by measuring the center between them; this *axis* is first drawn, and the line of columns then marked at either side. In the transverse section the letters refer to the placing of the heights of the principal divisions, the line of pavement being drawn first, A-A, then the line of the tops of the columns, B-B, then the centers of the vaults, C-D. After these main divisions are thus marked the detail, such as caps and bases, cornice, mouldings, and bands, is measured within them.

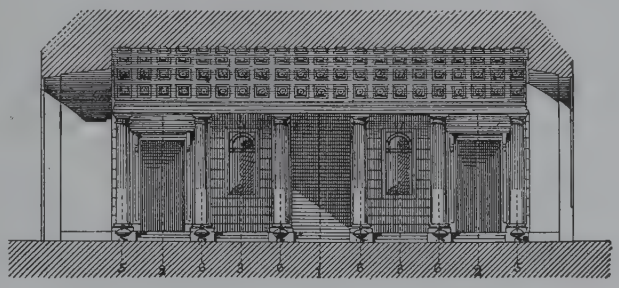


Figure 23. Longitudinal Section.

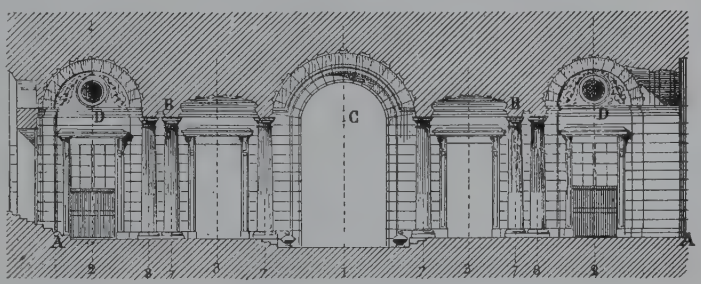


Figure 24. Transverse Section.

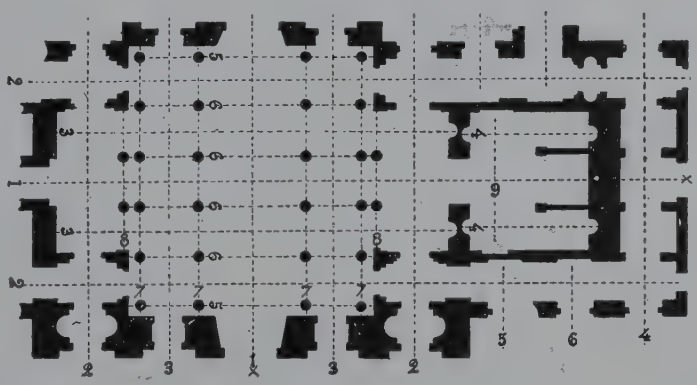


Figure 25. Plan of Vestibule.
Hôtel des Monnaies, Paris.
From Guadet's "Eléments et Théorie de l'Architecture."

In "taking a drawing up in scale," for instance, enlarging from $\frac{1}{16}$"=1'-0" to $\frac{1}{8}$"=1'-0", the same procedure is followed, the axes always being the first lines drawn.

The study of design, however, is something more than architectural drawing. It is, like painting and sculpture, a study of composition. To compose one must have things to compose with. Painters and sculptors use primarily the human figure, but use other elements also, such as trees, animals, and architectural forms. Architects compose entirely with architectural forms —the "elements" of architecture— walls, doors and windows, base courses, band courses and cornices, columns and entablatures, vaults, ceilings and stairs; the study of architectural design is done by means of definite problems in these elements, later by problems in groups of the elements.

The procedure in the study of a problem is quite simple. The proportions of the big masses are studied at small scale; *these proportions are fixed while the drawings are at small scale,* as they can then readily be judged. They should not later be changed without being tried again at small scale.

From D'Espouy's "Fragments d'Architecture Antique."

Figure 26. Detail from the Temple of Concord, Rome.

From D'Espouy's "Fragments d'Architecture Antique."

Figure 27. Capital of an Order in the Interior of the Sacred Enclosure, Epidaurus.

From D'Espouy's "Fragments d'Architecture Antique."

Figure 28. Detail of Frieze, Temple of the Sun, Rome.
Restoration by P. Esquié.

From D'Espouy's "Fragments d'Architecture Antique."

Figure 29. Ionic Capital, Erechtheion, Athens.
Restoration by L. Ginain.

As the drawings are enlarged from scale to scale the proportions of smaller parts are studied, and the arrangement and disposition or ornament, until finally the details are considered: the profile of mouldings, the detail of ornament, the arrangement of the drawings on the sheet, and the presentation – the actual drawing and rendering of the problem.

The analytique is the only problem in which one can make a study of profiles, as it is the only problem in the Beaux-Arts Institute system presented at sufficiently large scale to allow such a study. Make the most of the opportunity. Do not look upon the analytique as a bore, to be rushed through with as soon as possible. Those who win the Grand Prix de Rome at the Ecole des Beaux Arts in Paris—perhaps the highest honor that can be obtained by an architectural student—start, as soon as they reach Rome, just such a study of profiles of elements. The plates of the "Fragments d'Architecture Antique" are reproductions of renderings of elementary architectural forms by these men. Figures 26, 27, 28, 29, and 31 are given to show the care used in rendering the details of form of these fragments faithfully. They are also very good documents for use in studying analytique problems, and for drawing and rendering the large scale details usually required.

Once you have left the analytique, the opportunity has gone for making any real study in the atelier, under criticism, of moulding profiles, of architectural ornament; and yet those who lead the profession today are those who are known for the quality of this very part of their work. Figures 16, 18, 22 and 30 are examples of carefully studied detail from well known offices.

When you reach Class A—even Class B plan—you should know how to compose a door or a window. There will be no time then to learn this. You will be occupied in composing *with* doors and windows, etc. It is now, in the analytique, that you must acquire a knowledge of such "elements" to serve as a foundation for all your future work.

This brings us to another point that we shall consider in the following chapter. All the details must be taken from good documents or from good examples of executed work, if that is possible. Later on there will be opportunity for originality, individuality, fantasy and caprice, which are entirely out of place until they can be founded on a knowledge based on studies of the "Classics."

Note—For the sake of greater clearness, the axes have been drawn in on Figures 19, 20 and 21 from Guadet.

Figure 30. Detail of Entrance Door Architrave, Leader Building, Cleveland, O., Charles A. Platt, Architect.

From D'Espouy's "Fragments d'Architecture Antique."

Figure 31. Fragments Found at Pompeii. Restoration by E. Paulin.
An example of good rendering of details, as well as good composition of the sheet.

Figure 32. Northwest Side of the Rear Court, Villa di Papa Giulio. From Strack's, "Baudenkmaeler Roms." Designed by Vignola, author of the "Handbook" on the "Five Orders of Architecture", so well known in its many modern editions.

THE "ANALYTIQUE" OR ORDER PROBLEM

Chapter IV

THE USE OF DOCUMENTS

ARCHITECTURE—at least that part of it that has to do with design—is not a mathematical science, and its study is not based on fixed rules, logically following one another, as is the case with geometry or calculus. It thus seems sometimes to the student as if there were nothing to start on, nothing to use as a basis on which to build. And yet trained designers go about their work with assurance: one watching them sees that there are evidently some principles underlying their work—that there is a point of departure, and that from this their thoughts develop in an orderly sequence as they work on a problem, though they might be at a loss to put into words the reasons for each step in the development.

Now to design is to compose, but to compose one must have objects with which to compose: for the architect these are the "elements of architecture" already mentioned.

Figure 33.

Each one of us has certain elementary ideas of proportion. We should probably all agree—I include the layman—that the window in Figure 33 is fat and squatty, that the door is too thin. This feeling is the result of tradition. We and our ancestors have become accustomed, through the centuries, to doors and windows of certain proportions; this is true in some degree of all the "elements." Changes in these proportions have been made only when forced by structural or other considerations. Each door, each window, each building that has been done is a step in a big evolution. Once or twice a break has been made—the beginning of the Renaissance, and the so-called "revivals,"—but these were breaks back to an earlier tradition, not a cutting loose from all tradition. The one-man "original" styles—such as the Sullivan style—have not made headway because they cannot find an audience, the forms being strange to the average beholder, who does not take kindly to them because they are strange—queer—to him.

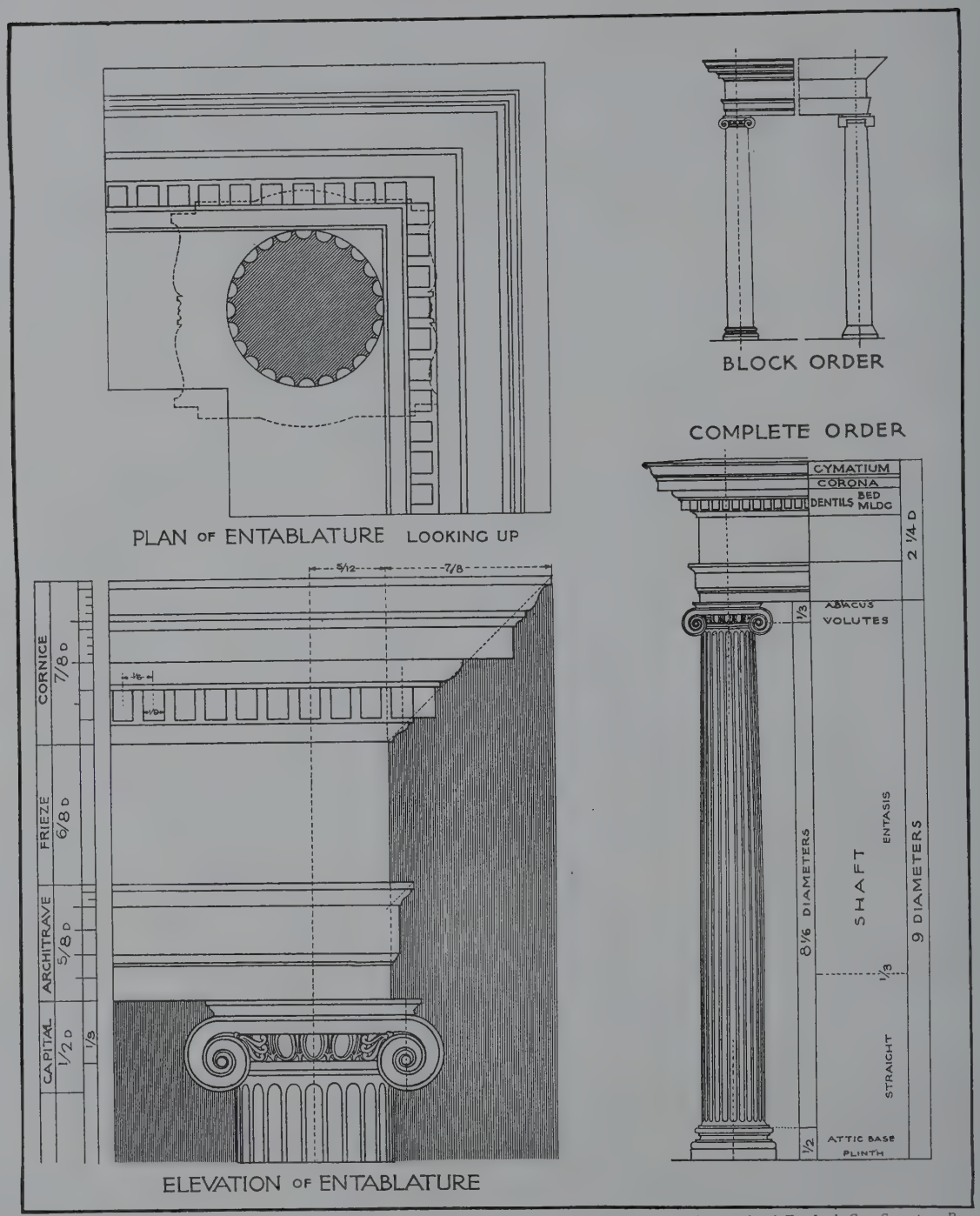
Therefore, the study of design—of proportion—resolves itself into a study of tradition; the study, in essence, of the worthy efforts of the past, the unworthy being passed by where there is such a quantity of material. To this the designer has added his contribution when his design is made to suit new conditions, new methods of construction, new aesthetic requirements. So to study the proportions of the elements, we study the proportions used by the masters for those elements, from actual examples, if possible, or from books or photographs. We find that they vary, but within certain limits.

Your critic will help you to form your feeling for proportion. If you make an intelligent study yourself among the documents, *always looking at the scale at which they are shown to obtain an idea of relative size,* your progress will be more rapid. You will also in this way discover interesting details, profiles and ornament to add to your "vocabulary."

A word or two as to what documents to use will not be amiss. Perhaps the best known and most widely used document among architects is Vignola's, "The Five Orders of Architecture," in one of its many editions. It is well to understand just what the "Vignola" is. One of the plates, that for the Ionic order, is shown in Figure 34. This as first drawn was supposed to be an approximation of a number of examples of the Ionic order in antiquity, the effort being to retain the beauty of each, and yet reduce the proportions to a formula to serve for common use. Vignola made such an approximation for each of the orders. * You will note at the side some divisions of the height into simple proportions, and equally simple subdivisions of these proportions. It is for this that "Vignola" is good—to lay out an order rapidly and know that the proportions so drawn are acceptable. Beyond this, however, the Vignola should not be used. To lay off details of an order at large scale from a Vignola plate is not sound, for his order is only an approximation.

Let us compare this approximation in Figure 34 with some of Vignola's executed work, for he was

* *Based on the book of Vitruvius, a Roman architect of the time of Augustus, of which the manuscript was rediscovered about 1452. It contained a series of rules regulating the employment of the various orders and their correct proportions. The drawings referred to in the manuscript were not found.*



Copyright, 1902, by William R. Ware

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Figure 34. The Ionic Order. From "The American Vignola." The "D" used in the proportional divisions at the extreme left and right means the diameter of the column, taken just above the base.

an architect of great ability. Figures 32, 35 and 36, from the Villa di Papa Giulio, show the Ionic order, as does also the small Roman palace on the Piazza Navona, shown in Figure 37, both works of architectural charm. You will see that neither one of these orders is exactly like the "approximation" of Figure 34, nor are they like each other; each has a character of its own. The illustrations that are made from geometrical engravings can readily be compared with the Vignola plate. Figures 39 and 40 show examples of the Ionic order as used by the Romans—fragments that were used by Vignola, no doubt, in making his approximation. If these are studied carefully, dividers in hand, comparing projections and relations of members (and that is a good way to study proportions), it will be seen that, while the order in each is different, the variation is within rather narrow limits. Architectural proportions are not *fixed* but are living things, and change somewhat in relation to the use to which the elements are put.

The Vignola plate is good, therefore, in the early stages of an analytique, when the proportions between members are being studied. When this has been done, it is time to look for other documents to study the profiles and combinations of mouldings, the character and variety of ornament, stone jointing, the study of plan and section, and finally the actual presentation—both the arrangement on the sheet and the rendering.

It is here that the student in the large city, with its public library art collections, has quite an advantage over the man in the small town. The consolation of the latter should be that, if he has only one or two good books to consult, he can become thoroughly familiar with them, and will avoid the danger of becoming superficial by scattering his attention among many. He will be fortunate if he can use any one of the following books.

For the man in the city, the problem is simple: he has only to have enough ambition to go to the library to look up detail, and there make tracings *and freehand sketches* from documents, again noting *plan, section and elevation* wherever possible, or drawing a profile line through the mouldings of an elevation, this profile being drawn to conform to the modeling shown by shadows or rendering of the plate or photograph. A list of books that a student should become familiar with would contain, perhaps as first choice, the following:

a. Guadet: "Eléments et Théorie de l'Architecture" (for analytique, especially Vols. 1 and 4). This is invaluable in giving an idea of appropriate character in architectural design. It has been called "The Bible of Architecture," with good reason, for it contains all the principles of a thorough knowledge of the art; a student cannot too early become familiar with it. In addition to a full explanation of all the "elements," it contains a complete exposition of the "orders"—complete except for the visualization of proportions by convenient divisions for rapid drawings (mentioned above in reference to Vignola). In later work, it will be of constant value for its analysis of the various divisions of architectural problems.

b. D'Espouy: "Fragments d'Architecture Antique," two volumes, and "Fragments d'Architecture—Moyen Age et Renaissance." These plates are reproductions of the measured drawings by the men at the French Academy in Rome who have won the Grand Prix at Paris. In addition to being well-chosen examples of the details of architecture of antiquity, they are completely "modeled" in the rendering, and are of the greatest assistance in making a rendering of the large-scale details called for in the analytique. One cannot work from these plates without acquiring an insight into the whole theory of modeling as applied to architectural drawing to express form. See Figures 39 and 40, and the others in this book taken from D'Espouy.

c. Gromort: "The Elements of Classic Architecture," a work of great usefulness and not expensive. It is a collection of plates showing the use of the elements of architecture—usually including the orders—in buildings that are now considered classic, some being Roman, some Italian Renaissance, some French Renaissance. There are also plates showing the cast shadows on the orders.

d. Letarouilly: "Edifices de Rome Moderne," from which is taken Figure 37. I mention this work because an inexpensive reprint with plates large enough for all ordinary purposes can be obtained. It contains some of the best examples of Italian Renaissance architecture and has had a direct and strong influence on the architecture of this country. There are other volumes by the same author on the Vatican. Of these Figure 63 is an example.

Figure 35. Section, Villa di Papa Giulio, an executed work of which Vignola was the Architect. From Letarouilly's "Edifices de Rome Moderne." The stairway at the right of the center is better shown by the photograph reproduced in Figure 32.

Figure 36. Villa di Papa Giulio, Northeast Side of Forecourt. Giacomo Barozzi da Vignola, Architect. From H. Strack's "Baudenkmaeler Roms."

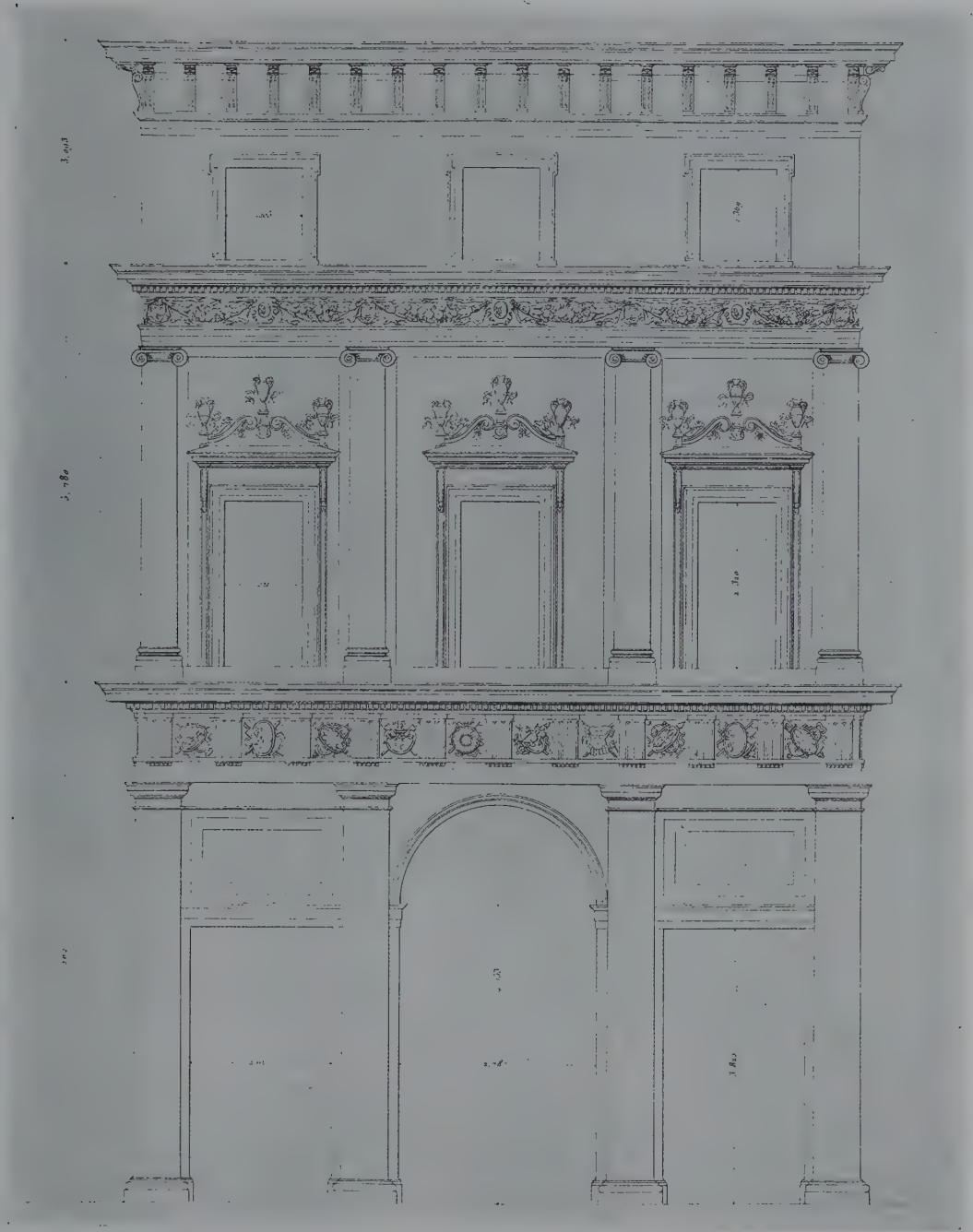


Figure 37. Elevation of a Small Palace, Piazza Navona. Giacomo Barozzi da Vignola, Architect. From Letarouilly's "Edifices de Rome Moderne."

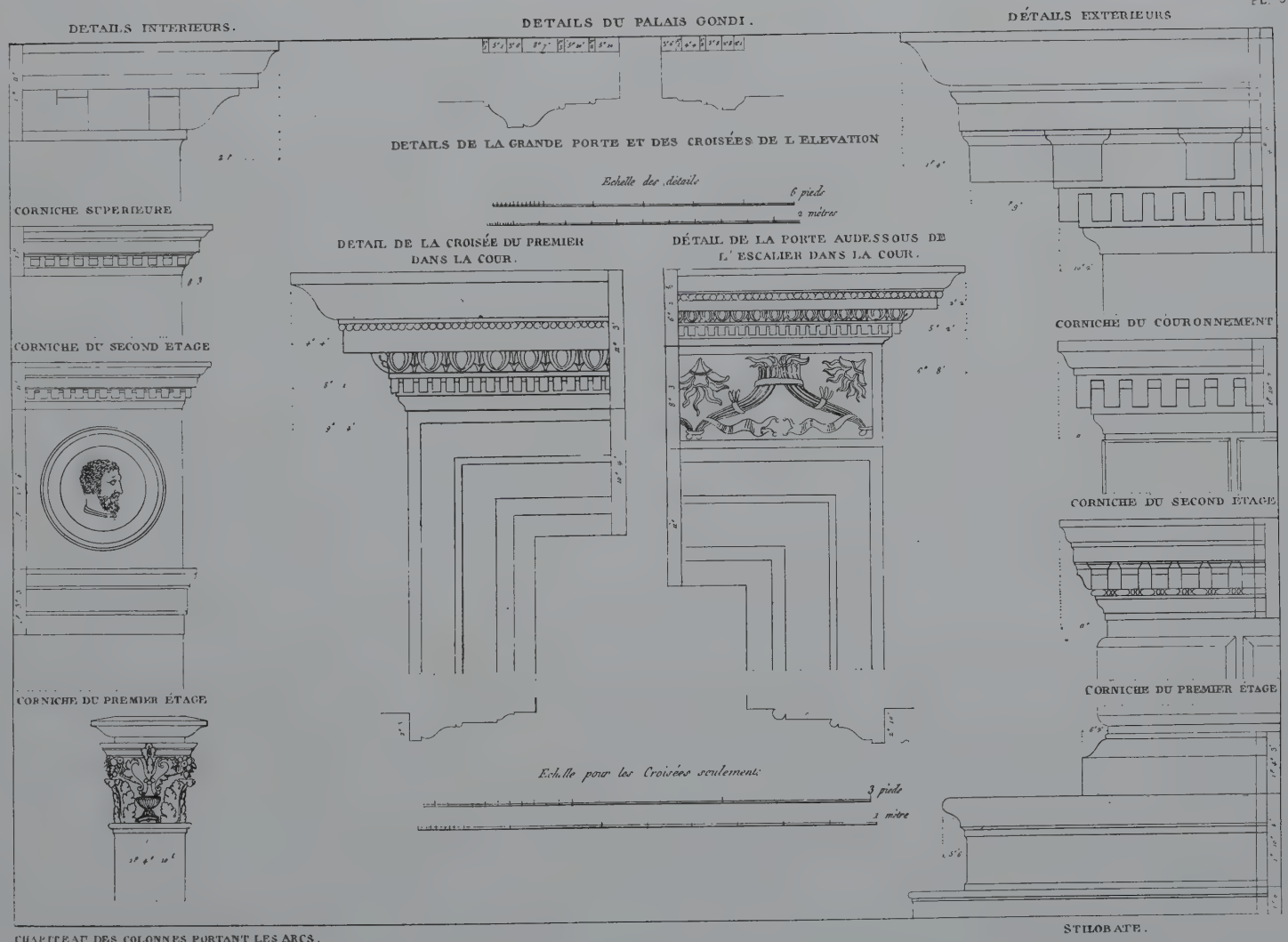

PL. 54.
DETAILS INTERIEURS.
DETAILS DU PALAIS GONDI.
DÉTAILS EXTERIEURS
DETAILS DE LA GRANDE PORTE ET DES CROISÉES DE L ELEVATION
Echelle des détails
6 pieds
2 mètres
DETAIL DE LA CROISÉE DU PREMIER DANS LA COUR.
DÉTAIL DE LA PORTE AUDESSOUS DE L' ESCALIER DANS LA COUR.
CORNICHE SUPERIEURE
CORNICHE DU SECOND ETAGE
CORNICHE DU PREMIER ÉTAGE
CORNICHE DU COURONNEMENT
CORNICHE DU SECOND ETAGE
CORNICHE DU PREMIER ÉTAGE
Echelle pour les Croisées seulement.
3 pieds
1 mètre
CHAPITEAU DES COLONNES PORTANT LES ARCS.
STILOBATE.

Figure 38. Details of Gondi Palace. From "Architecture Toscane," by Grandjean de Montigny et Famin.

Figure 39. Detail of Basilique Ulpienne, Rome.
From D'Espouy's "Fragments d'Architecture Antique."

Figure 40. Detail of Theatre of Marcellus, Rome.
From D'Espouy's "Fragments d'Architecture Antique."

Figure 41. Detail of Doorway, Period of Louis XIV, Palace of Versailles. From César Daly's "Motifs Historiques."

e. César Daly: "Motifs Historiques." Details of the French Renaissance, with examples of all the "period" styles. See Figure 41. Note that profiles of the cornice and other details are shown, as well as sections through band mouldings, trim, etc. It is by studying the profile that the form is most easily understood.

f. Pfnor: "Architecture, Epoque Louis XVI." This work, among other useful details, shows examples of beautiful mouldings as well as wonderful examples of presentation.

g. Blondel: "Decoration, Extérieures et Intérieures des XVII et XVIII Siècles."

h. Grandjean de Montigny et Famin: "Architecture Toscane." Exceedingly carefully drawn examples of the architecture of the early Renaissance about Florence, where detail was executed with great care. Figure 38 shows two interior cornices, which may be contrasted with an exterior cornice on the same plate, showing the difference in scale of the mouldings. See also Figures 59, 62.

i. "Palast Architektur, von Ober Italien und Toscana, Bologna, Venice, Vicenza, etc." These are measured drawings and photographs of the architecture of the Renaissance in Italy, with a wealth of detail.

. . . . . .

The details of an analytique *must* be taken from good documents if the student's work is to stand any chance of obtaining an award higher than a bare "mention" at a judgment. A cap or baluster drawn from the "Vignola" will not be sufficient. As Guadet says, "Our art is an heir rich with the accumulated legacies of the centuries; its invariable principle is reason, logic, method . . . the classic is not the privilege of any time, country or school . . . . its principles are the same in all artistic ages, in spite of difference in exterior forms."

With these books, or even with any *one* of them, the student will be able to develop a vocabulary of architectural forms—the elements with which he will compose. By an intelligent study of their contents, he may acquire a knowledge of many principles of design. If he will draw mouldings from several sources *at the same scale,* for instance, he will gain an idea of "scale," and will avoid a difference in scale in the mouldings of an impost and an entablature on the same drawing. By tracing or sketching a number of good profiles from these documents, he will come to understand why some combinations are pleasing and others not; by examining the use of ornament, he will see that ornament must do several things—that it must be in good taste, that it must fit the shape of a moulding, if on a moulding, or a panel if in a panel, that it must be in proper scale, and that it should be appropriate in character, or at least not inappropriate—a form from a classic temple, for instance, could not be easily used on an informal residence.

We have spoken of a number of documents that should be consulted if possible. There are one or two that should *not* be used for the analytique. They are the "Grand Prix" plates, or the "Medailles," or other work of the École des Beaux Arts at Paris, or similar work of schools here. It should not be forgotten that they too are the work of students; they are not in any sense a substitute for constructed architecture that has stood the test of time. Reproductions of premiated analytiques of the Beaux-Arts Institute of Design have one value—aside from their use in setting a standard of workmanship and presentation—and that is for the study of the composition of the sheet, the arrangement of the large scale details with the small scale projections. This will be considered later.

Study from books and photographs will mean much more if at the same time the student carries on another means of study — sketching from actual examples of good architecture, the sketches to be made in plan, section and elevation primarily, even though the object sketched can be seen only in perspective. The object of such sketches is to develop the ability for grasping the actual form of architectural members. When one can draw, for instance, the cornice of the University Club in New York City, from the street, in *plan, section* and *elevation,* he will comprehend its form much more clearly than if he drew a *perspective* sketch from the same position. The mind as well as the eye must be constantly used to do the former.

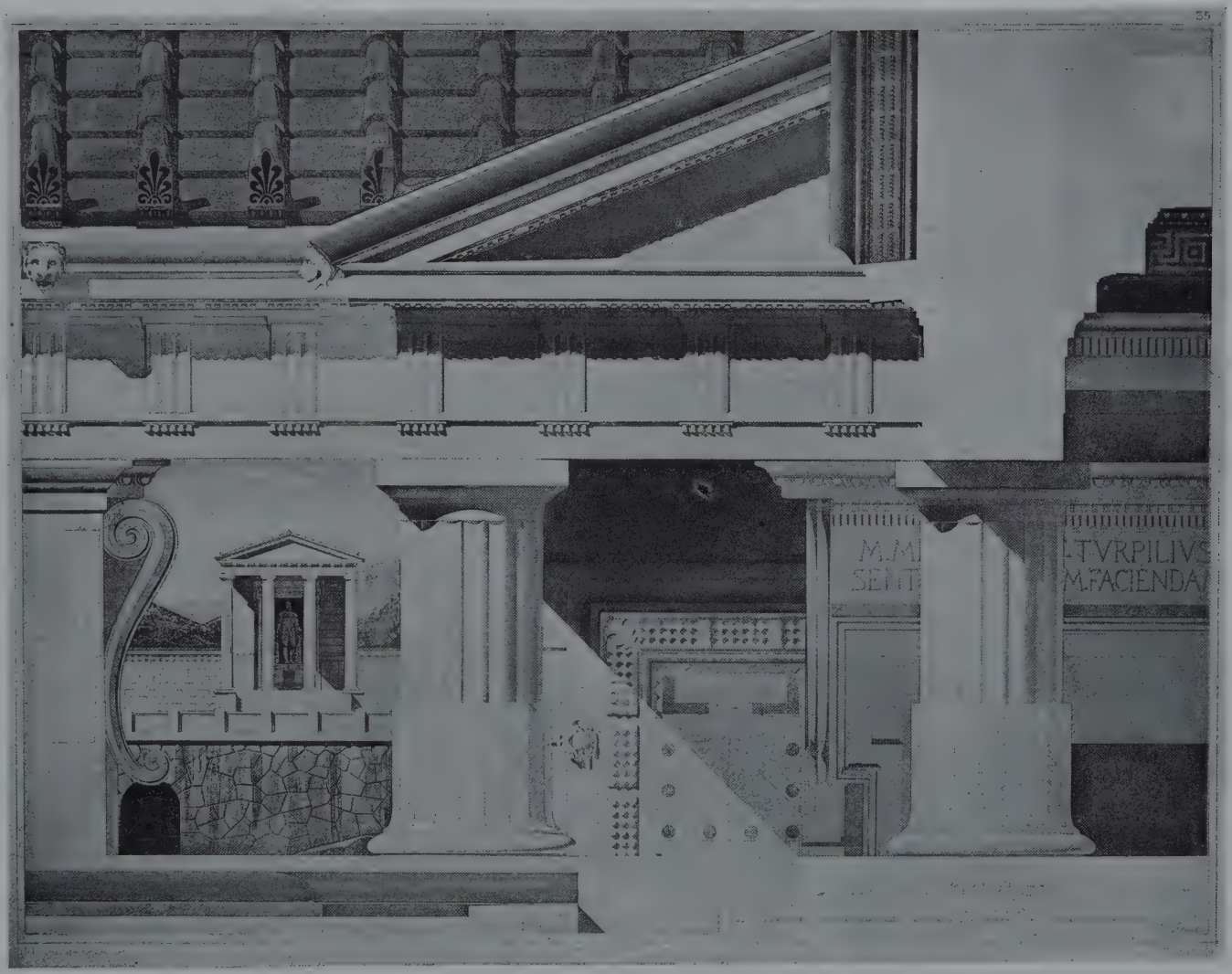


Figure 42. Cori, Temple of Hercules, from D'Espouy's "Fragments D'Architecture Antique." Restoration by V. Blavette. An example of a "composed" sheet, showing plan and elevation at small scale, and details at larger scale.

THE "ANALYTIQUE" OR ORDER PROBLEM

Chapter V

COMPOSING THE SHEET

THE analytique program requires, in addition to plan, section and elevation drawings, details of the architecture, especially of the order, when an order is called for, at a scale enough larger to require a study and careful drawing of profile and ornament. It is conceivable that these might be presented as so many separate drawings, neatly arranged on a sheet, in the manner of some of the plates in books on architecture, and as indicated in Figure 43a. (See Figure 62 from "Architecture Toscane.") As the drawings require cast shadows and rendering, however, and as some sort of tone in the background is usually necessary to show silhouette, the required presentation takes the form of a composition of the required drawings in the manner of a "frontispiece."

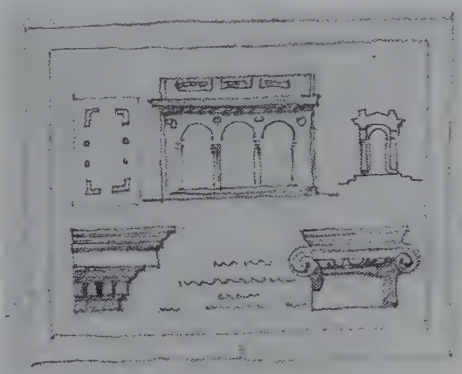


Figure 43a.

In studying this composition the published work of the Beaux-Arts Institute is very useful, showing a number of successful examples, some of which are remarkably good. As the problem requirements are never exactly the same, a certain amount of originality is usually necessary, but to keep the work from being a constant repetition of the same ideas with only slight variations, it is well to look further afield for inspiration if one wishes to do really good work in composing these fragments.

The frontispiece projets at the Ecole —published in the "Medailles d'Ecole" and "Concours Rougevin et Godeboeuf"— may be used, although they are also "school" work; but there are many other documents that may be made use of, for at the beginning of the last century such compositions were much in favor. But still earlier than that, Piranesi, having made numerous researches among the ruins of Rome, published the many volumes of his etchings, among which are a number of brilliant compositions of architectural detail. Figure 43 is a portion of one of the best known of these, and it is full of inspiration as to ornament as well as composition. It was dedicated to his friend Robert Adam, who worked in Rome with Piranesi for a while before he returned to England to do that work which caused his name to be attached to a style. Figures 44 and 45 are two vertical compositions by Piranesi, freer in treatment but likewise composed of architectural fragments. They also are frontispieces: the portion here used for lettering would, in the analytique, become the principal small scale drawing of the problem—usually the elevation.

Figure 43.
Title from corner of Piranesi's Map of Rome.

Of those who used this type of presentation in the last century perhaps the most interesting are Percier and Fontaine, masters in the Empire Style, whose book, "Palais et Maisons de Rome," was published in 1798. Figure 54 is one of the title pages from this book. Figure 59, from "Architecture Toscane", by Grandjean de Montigny and A. Famin, is very much like an analytique, except that the fragments shown have probably no connection with the small-scale drawing in the center, and there is a much greater use of perspective than is usual in an analytique, Figure 46—from a book published in 1840 by an architect in Nantes named Scheult — is a very

Figure 44.

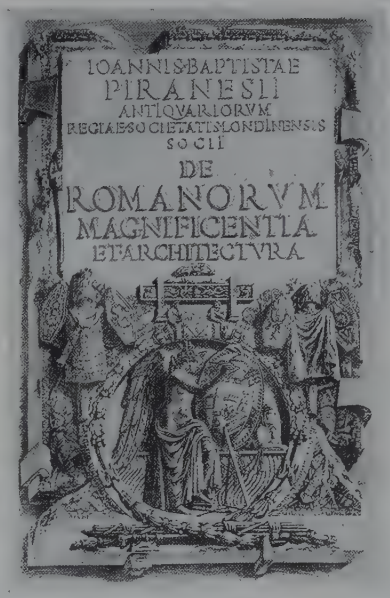


Figure 45.

Title pages from Piranesi's books of etchings of Rome.

Figure 46. A composition from Scheult.

Figure 47.

Figure 48.

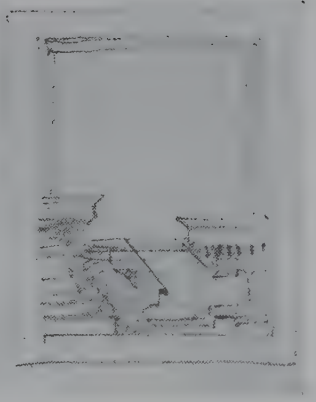


Figure 49.

good example of a composition in which the large scale details are used at the bottom only, instead of forming a complete frame, as was the case in Figure 59. Analytiques are frequently made by the men at the French Academy at Rome, who have won the Grand Prix de Rome. See Figure 42. Others of these are shown in D'Espouy's "Fragments d'Architecture Antique."

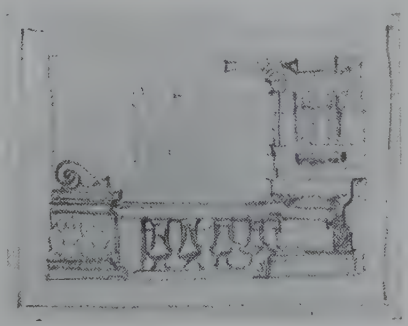


Figure 50.

Many more examples might be shown from works of this period and may be found in the art libraries in the large cities by those who wish to get fresh inspiration for this part of their training in design. For this composing of the sheet in the analytique is a study in pure design: instead of working with columns, cornices, balustrades, etc., as in architectural compositions, you now compose with drawings of varying size and at different scales, and with the rendering of these drawings. You can make, or break, a composition by the use of shadows, foliage in the foreground, etc., and the most successful way to attack this part of the problem is to start with this in mind, as we shall see in a few moments.

A study of published analytiques of the Beaux-Arts Institute will show that there are several well-known types of compositions. Perhaps the simplest is where the principal drawing at a small scale is completely framed by an arrangement of the details at a larger scale, and in this frame are frequently incorporated panels containing the small scale plan or section. Very often use is made of some architectural element of the problem—an arch, or part of a door or window head, either of the lintel or arch type—to make an enclosing feature at the top. The frame is completed by an arrangement of portions of the cornice and the column cap and base of the order, and sometimes a well drawn vase or cartouche is used to give the added interest of sculptural forms.

Figure 51.

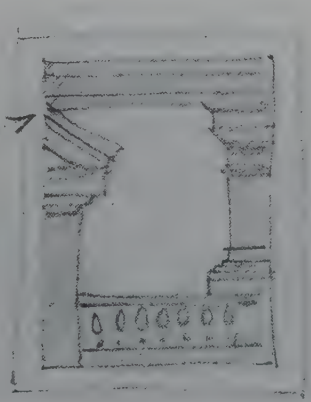


Figure 52.

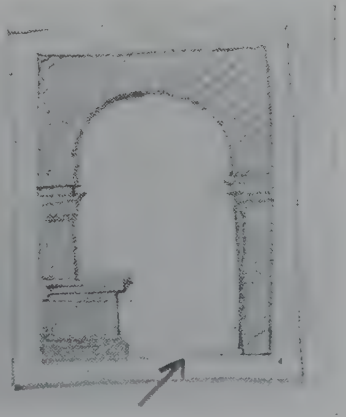


Figure 53.

Figure 54. A Title Page from "Palais et Maisons de Rome," by Percier and Fontaine, 1798.

Figure 47 illustrates this type: Figure 7 and Figure 9 are examples of particularly well drawn and presented analytiques of this kind. So, too, is the measured drawing shown in Figure 222.

Very similar to this is the scheme in which the upper portion is treated like the lower, i. e., with individual architectural fragments composed to form a complete frame, as in Figure 48—or the details may be grouped at the bottom, extending part way up each side, and a band or ornament or a moulding used on the upper portion of the sides and the top to complete the frame, Figure 49. In all of these cases, the outer edge of the composition being a simple rectangle, the inner line of this composed frame should be studied with care; this study comes under the general principles which may be found in any book on composition. For instance, Figure 49 would not look as well if the wall behind the cap and cornice were raised to the top line of the cornice; also, the cap and the cornice both extending above this wall, being of different mass, would not look well if they extended the same distance above the wall. The shadow cast by the cap carries the eye around at the base, instead of letting it run off down the edge of the column base and out of the picture. In the same way in Figure 7, the lines of the arch at either side running down, the eye is turned around at the bottom by the vase and cornice at the right and the bush and capital at the left, instead of being carried out of the picture by the strong verticals at either side.

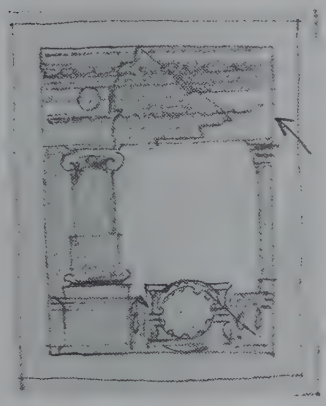


Figure 55.

Figure 56.

Another unusual type, shown in Figure 50, is where the details form a frame on two sides only, one of these being the bottom: on one side an architectural detail is carried to the top, and on the other there is usually a small accent to raise the line of the composition, to carry the eye around. Similar to this is another composition frequently used, with detail completely across one side only—the bottom—and details on either side at different heights, but not reaching the top, as shown in Figure 57. Figure 8 is of this type. When the section required is at the same scale as the elevation it is sometimes made a part of the small scale picture, either joined to it as in Figure 1, or placed at one side as in Figure 8. At other times it and the plan are treated as part of the frame, being enclosed in panels or placed on forms that can be composed with the large-scale fragments.

At other times plan and section are treated as incidental, explanatory diagrams only, and placed on the sky or foreground of the enclosed drawing (Figures 1, 7 and 8), or superposed on the large-scale details as in Figure 2. In this case they must be drawn neatly, with section line indicated, but should not be further rendered as they would destroy the composition.

To learn to make compositions of this sort well requires real study, but a few suggestions as to what should not be done may be of assistance, all the examples being taken from work submitted in the competitions of the Beaux-Arts Institute.

It is not good to place a strong "black" in the

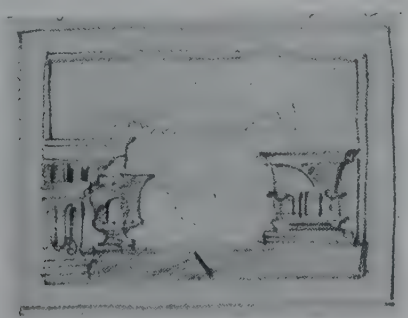


Figure 57.

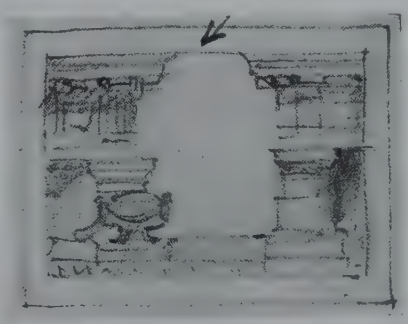


Figure 58.

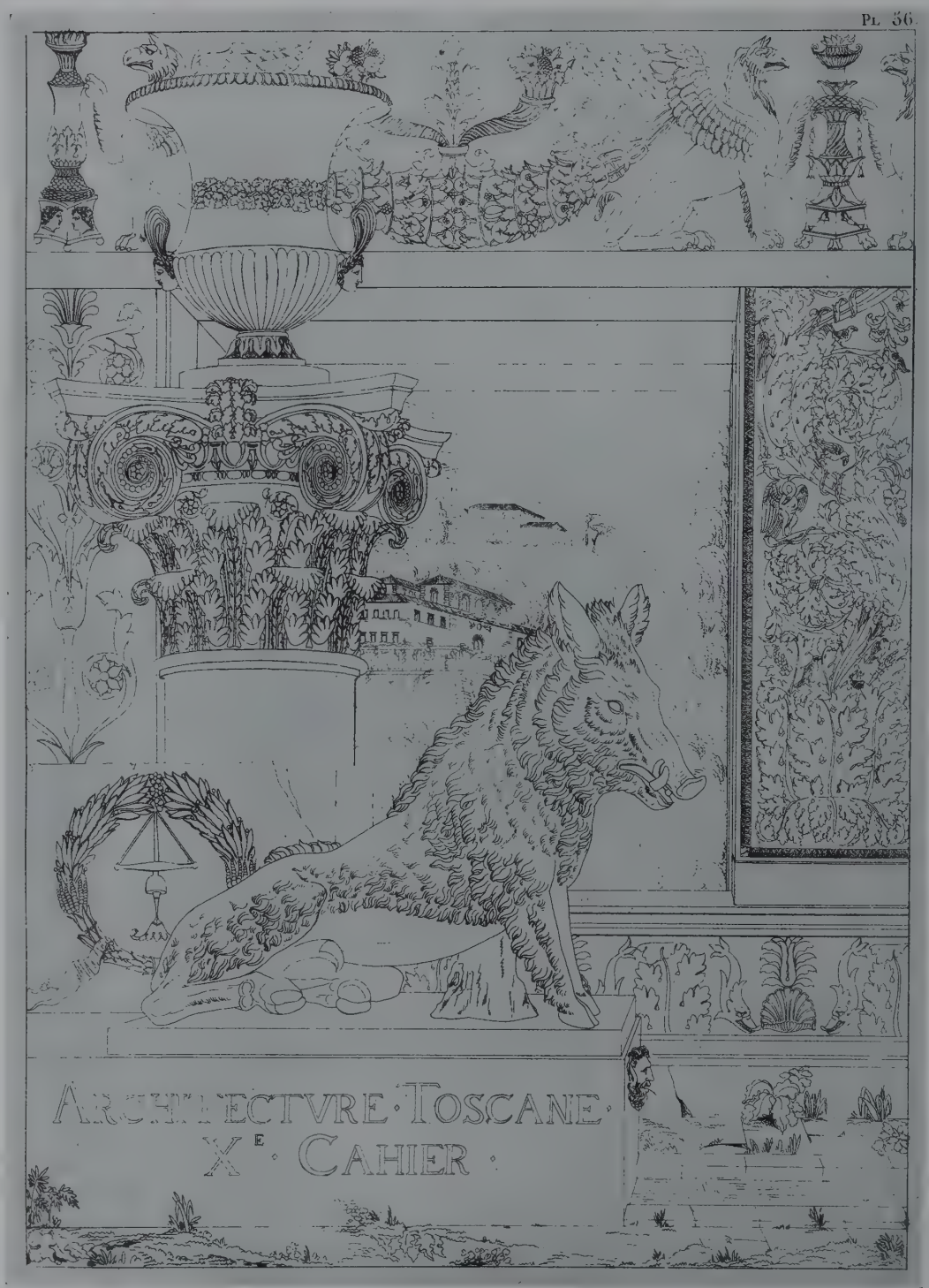


Figure 59. A Page from "Architecture Toscane," by Grandjean de Montigny and A. Famin, 1875.

corner of the picture, as in Figure 51, as the eye is continually being drawn there by such a large, dark, spot. Where a composition of this sort has been made the rendering should be lightened at such a place. Again, in composing a frame, care should be taken to see that lines do not form an acute angle leading out of the picture at, or close to, the edge, as Figure 52. Figures 53 and 58 are examples of frames that are almost but not quite complete, which is never very satisfactory. Of these two Figure 53 is more disturbing as the picture seems to fall out at the bottom, and a band of some thickness would be needed to counteract this feeling. In Figure 58 a thin band or border at this place would have remedied the defect. Figure 52 is unfortunate in the same way; one feels that the two sides could be "broken off." Figure 55 is an example in which the frame seems top-heavy, there being a much greater mass of the details above than below a line through the middle, and this effect is increased by the slenderness of the member at the right.

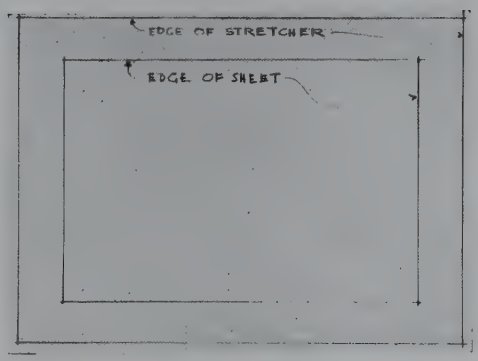


Figure 60.

It is almost unnecessary to say that the clever man learns how to transgress all rules, and still do a good piece of work, because he recognizes the dangers and takes steps to overcome them, usually by cleverness in rendering. For instance, Figure 44 from Piranesi, though top-heavy in the same way as is Figure 55, would make a good composition if the small scale elevation were drawn in the space now occupied by the lettering – provided this panel is still kept as a "white" and the elevation is very lightly rendered, almost as a diagram, preserving the feeling of a "drawing" – in two dimensions – while the details are strongly modelled in light and shade, bringing out the third dimension.

There are some special arrangements required from time to time that tax the ingenuity of the designer, but these should be studied in the same way. Thus a double study of a colonnade may be asked for, one of them two stories high, one three stories. Two elevations are thus required of equal importance: this necessitates the composing of a double frame—a frame for two pictures. Figure 1 is a frank and successful treatment of such a requirement. Another problem, a "Pavilion in a Public Place", required two drawings at small scale—the end bay and the entire façade—but at different scales, and of quite different size. Figure 10 shows how one competitor solved this problem, which also required a double frame.

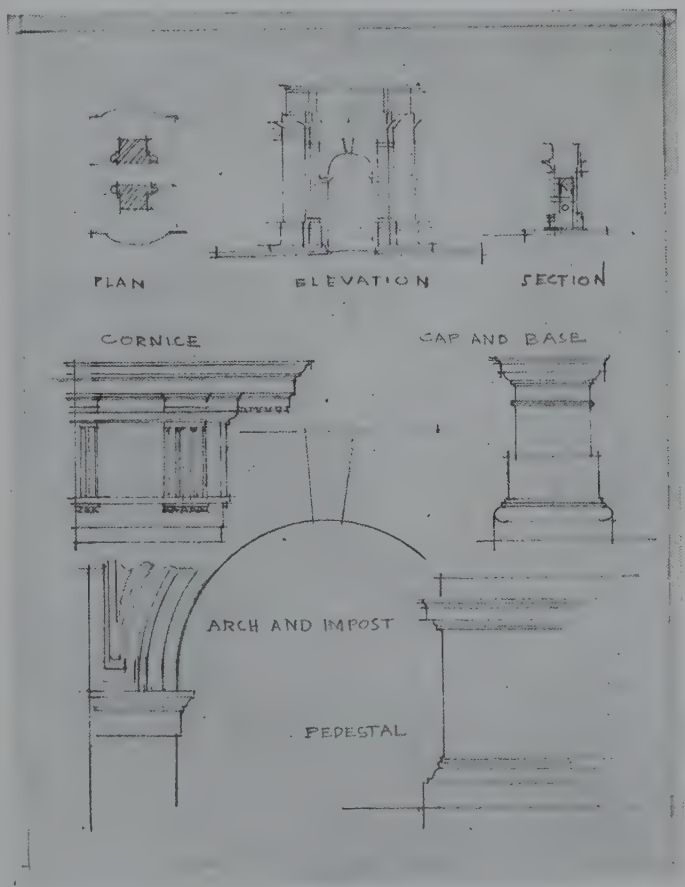


Figure 61.

It is best first to study this composition of the sheet by means of small thumb sketches, and then, one of these having been selected, to go at once to final scale, using charcoal, and getting the big effects as rapidly as possible. A good way to make the small sketches is to lay out the size of the final stretcher – 31-in. by 40-in. – at the scale of one-eighth inch equals one inch. (Figure 60.) If the drawings called for are large in size the entire sheet may be needed; usually it is possible to have a border of 3 or 4 inches all around, and the drawings look much better when the sheet is small enough to allow this much of the

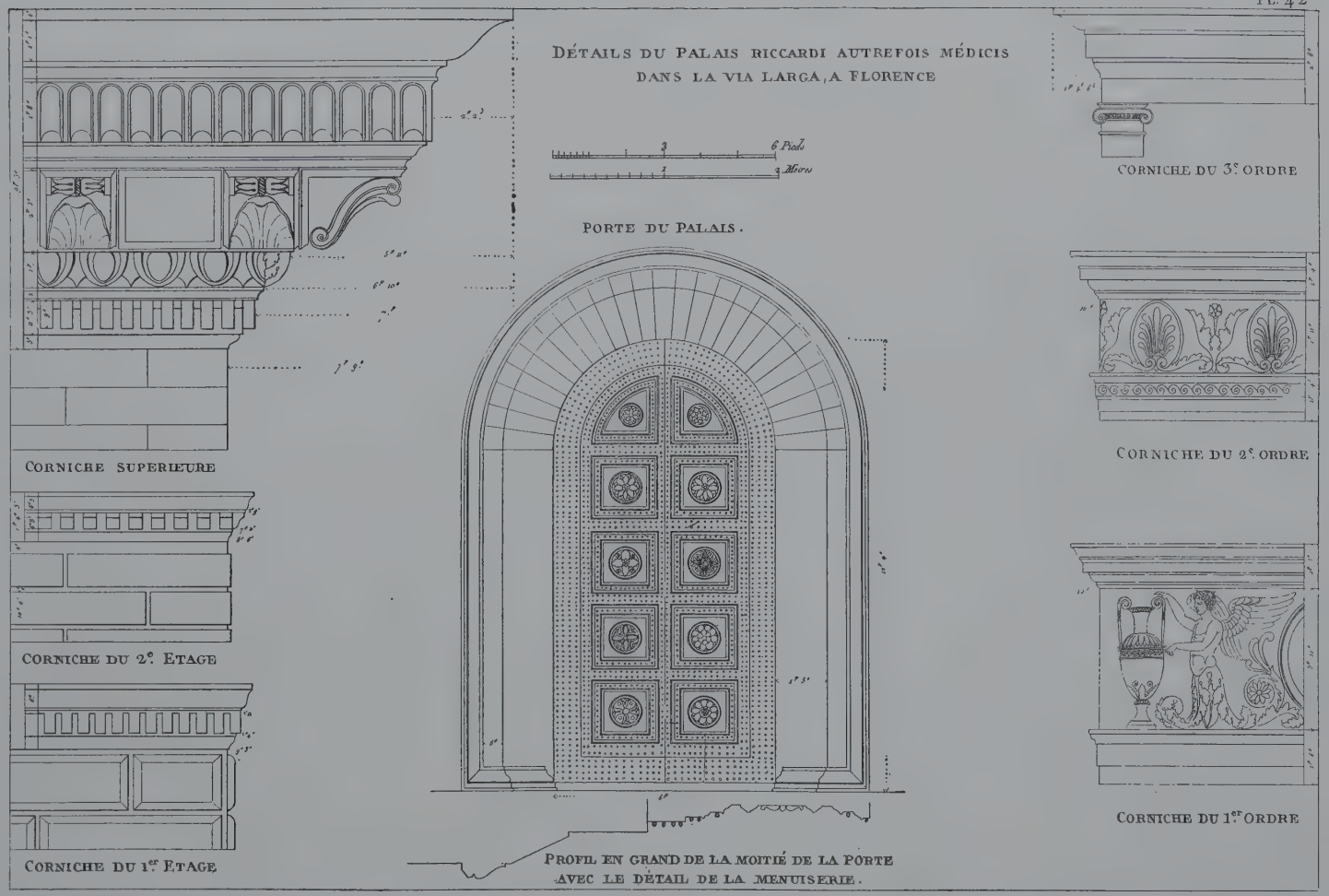


Figure 62. Details of the Riccardi Palace, Florence, Begun 1430, A. D. Designed by Michelozzo Michelozzi. From "Architecture Toscane."

stretcher to act as a mat. Of course the space so left should be equal all around, or a half inch or so larger at the bottom. We may draw such a border on the diagram—Figure 60. Then if we make at the same scale diagrams of the elevation, section, plan, and of the details, we shall have everything ready to study the composition. If the elevation called for, say at half inch scale, measures at that scale ten actual inches by eight, and the plan at its final scale measures three actual inches by four, and the section three inches by six, these should be laid off in the diagram at the scale of one-eighth inch equals one inch, as in Figure 61. Likewise the details are laid off; if the cornice at the required final scale measures eight inches in height, we make a diagram at our scale, the length being indeterminate; cap and base are also drawn in the same way, and the shaft may be lengthened or shortened as needed by the composition, just as we may use more or less of the cornice for the same reason.

We now put tracing paper over our diagram sketch, Figure 60, and trace the limits of the drawing; then we put it over our diagrams of drawings, Figure 61, moving it around as we try different arrangements of these drawings, tracing freehand a detail when it seems to fit into the composition, Figure 56. In this way a number of compositions may be tried very quickly on tracing paper, some being vertical, some horizontal. When one is chosen as the best it may be studied a little further in the same way, roughing in the shadows, and such accessories as trees or shrubs on the principal drawing, as they are frequently of great assistance in making a pleasing composition, and we find that the dark tones must always be reckoned with.

When this is done a layout at full size may be made in charcoal to determine the position of the different drawings on the final sheet. This drawing may be made in just the same way as the small one, on tracing paper, the actual drawings at final scale taking the place of the diagrams at the one-eighth inch equals one inch scale. If this is done a more careful drawing of the entire composition, with T-square and triangle, will not be necessary, and the various separate drawings – elevation, plan, large scale details, etc. – may be "rubbed" on the final sheet directly, in the *position determined by the rough charcoal layout.*

Arrangement of architectural fragments by Piranesi, and used by him as a dedication page.

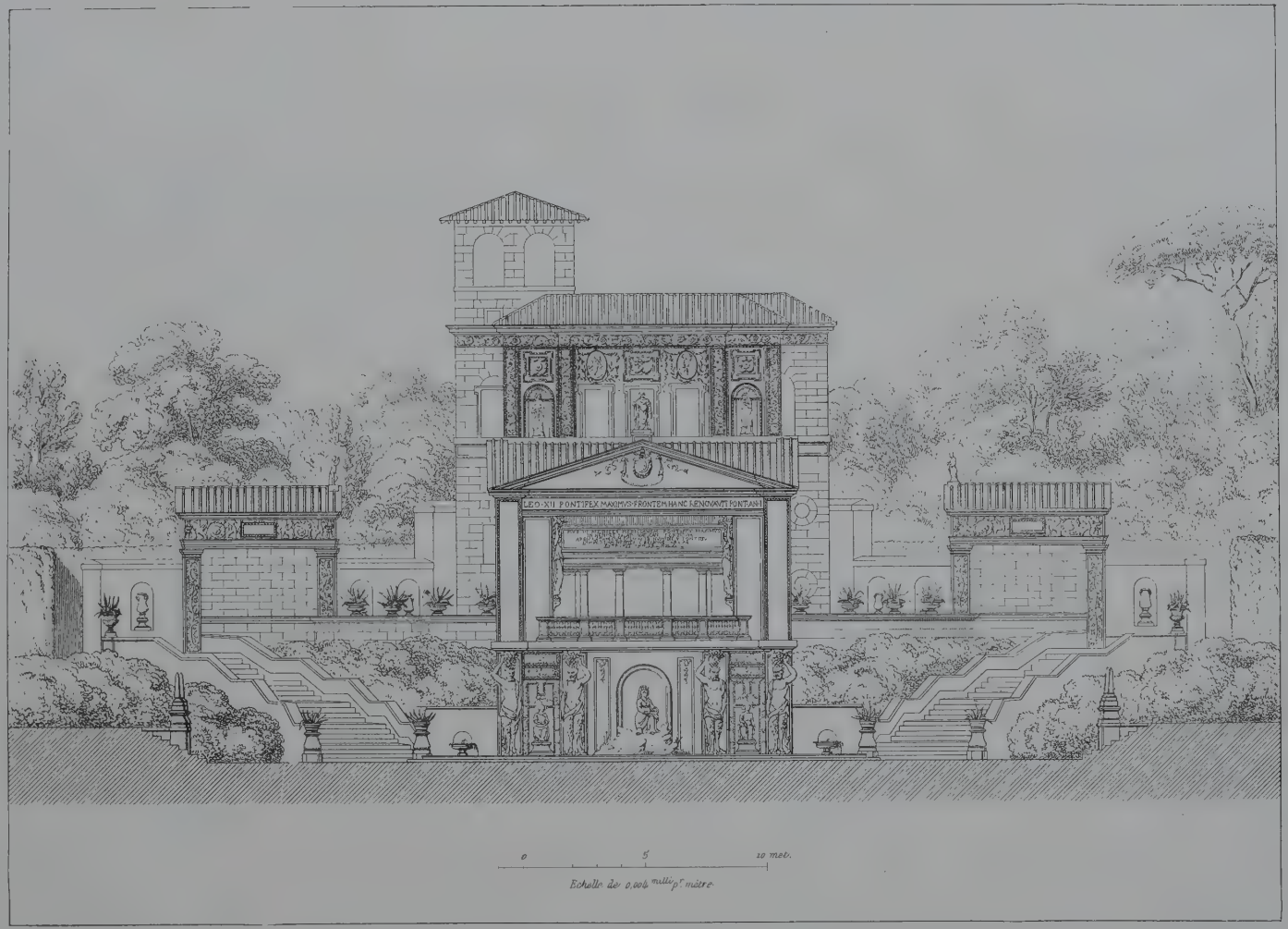


Figure 63. Elevation from Lower Terrace, Villa Pia in the Vatican Gardens, from Letarouilly's "Vatican." For plan see Figure 178. This illustrates very well how an elevation drawing should look when it has been inked in and, save for cast shadows, is ready for rendering. When there has not been time to make a rendered study, it is better to draw all foliage in pencil only, so that any unpleasant surprises as to the composition of these forms, that appear in the rendering, may be cared for without too much difficulty.

THE "ANALYTIQUE" OR ORDER PROBLEM

Chapter VI

PASSING TO INK

WHEN the studies are completed, there are two ways in which the design may be put on the final sheet. The work may be drawn anew on the sheet, starting with the main axis-lines and making use of "ticking-strips" of paper to transfer a number of dimensions quickly; or a "rubbing study" may be made on tracing paper, which is then turned face down on the final sheet, and the pencil lines transferred to the latter by rubbing with a spoon or other rounded object through a piece of tracing cloth. Take care to rub always in the direction of the grain of the tracing cloth (parallel to the selvage), never against it, and to lift this tracing cloth from place to place on the tracing as successive parts are transferred, rather than to slide or drag it across the surface. Of course both methods may be used on the same drawing—drawing the details directly and rubbing the small scale drawings, or vice versa.

Each method has some advantages. The direct drawing is more accurate, and is therefore used frequently for competition work where careful drawing is essential; it is often used also by clever men in going directly to a final sheet from a very early study when time is short. This is satisfactory if all real difficulties of design have been foreseen and solved in the first sketches, and if the author has a good working vocabulary of architectural forms.

For most projet work, however, the rubbing study is a time-saving device for several reasons: the pencil slides more quickly over tracing paper; the dimensions having largely been fixed, and the rubbing study being made over another drawing on which all these dimensions are already laid out, no tedious laying off of measurements is necessary; and studies of different parts may be slipped under the rubbing study and drawn there in final shape.

Some parts of the work such as ornamentation of mouldings at small scale, dentils, modillions, and so forth, need be shown only by axis-lines on the rubbing study, and drawn directly in ink on the final sheet.

When transferring, the rubbing study should not be pasted on the final sheet if that necessitates putting paste where there is later to be drawing or rendering, as paste rots the paper and usually causes it to crack when washes are run over it. The rubbing study may be held down by pasting on it the ends of strips of paper, the other ends of which are pasted at the edge of the board, as in Figure 64a, or by pasting strips of paper, as in Figure 64b, in which case the rubbing study may be moistened with a sponge and allowed to pull itself tight by shrinkage before rubbing. The work of rubbing should be firm enough to transfer the lines sharply, but not so hard as to cause the rubbing study to buckle and thus blur the lines.

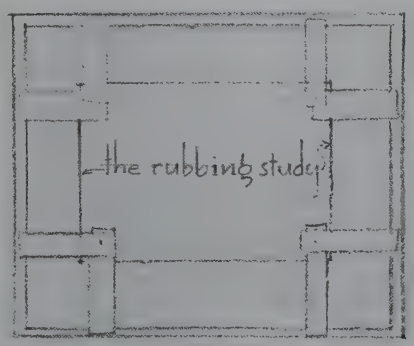


Figure 64a

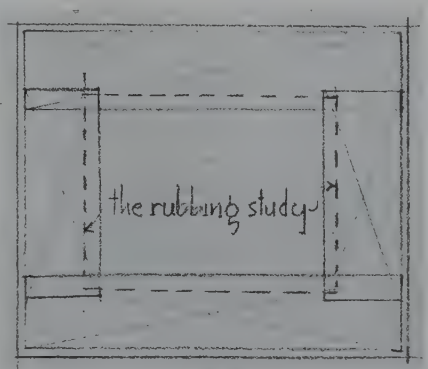


Figure 64b

The actual inking-in may be called a mechanical process, but the manner in which it is done may make or unmake a problem, other things being equal. The use of black ink is usually confined to inking the section line of plan and section—the outline of the constructed form. If the plan is at small scale, and the points of support small, they are usually entirely blackened in—if they are large, the edge is a black line and this is filled in with a wash during rendering. In any analytique black ink may also be used to outline the several details, or to separate the "frame" of details from the small scale elevation within. If a rendering is not entirely successful and the forms are confused, and lack of time prevents a more complete rendering, this outlining will clarify the drawing and make it readable, and if neatly done is not unpleasant.

For the rest of the inking-in—by far the larger part—the ink is diluted with water.

The diluted ink line should be fairly dark, for it is always possible to rub or sponge it to a lighter tone. If a drawing is made with an over-diluted ink, it is frequently lost entirely by a few washes of rendering, and it then becomes necessary to redraw portions, or to render very carefully, taking great pains at edges and contours. Unfortunately there usually is not sufficient time left to the rendering to allow this.

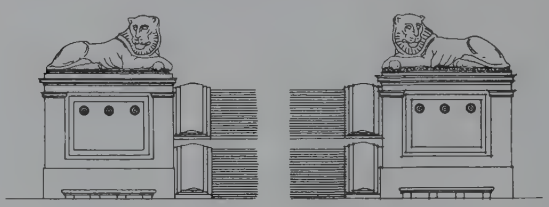


Figure 65a. *Figure 65b.*

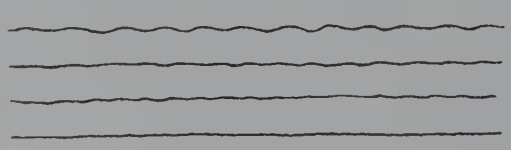


Figure 66.

Different values of diluted ink may be used to advantage: where an ornamented portion is filled with lines—for instance, an acanthus scroll frieze—it is frequently better to use a lighter ink rather than to have to rub it down after inking. When stone joints are inked in—often they can just as well be drawn with a hard pencil after the drawing has been cleaned down—a very much more diluted ink should be used. This may be said also of shadows which are inked in, for shadows should count rather as areas of tone than as patterns of line.

The actual line should be solid and "fat" enough to avoid any appearance of wiriness; it should begin and end firmly, and the meeting of two lines should be neatly made, as lines are used in architectural drawings to bound solid surfaces, Figure 65a. Usually the so-called "snapping" of lines at their intersection as in Figure 65b, gives a papery effect, and the little useless ends of the lines are very ugly in a carefully rendered drawing. This, of course, does not apply to sketch problems, where time is too short to make a careful drawing, and the snappiness of lines gives force and vigor to work which depends much more on its lines and less on its rendering than a projet problem.

It is very important for a draftsman to ink in freehand lines easily and with assurance. There is no trick or difficulty about this—it is simply a matter of practice, given a good drawing in pencil. In principle, however, it is well to remember that a freehand line should be "freehand," and not stiff and mechanical, and it is better to train the hand to use a wave motion, swinging above and below the line, crossing at regular intervals. Exaggerated, this is shown in Figure 66. As the draftsman gains control over his hand the oscillations become invisible to the naked eye, but a sense of vibration is present which gives freedom and character to lines so drawn.

The less able a draftsman is to draw well freehand, to express projections of rounded mouldings, and free ornament, the more he should introduce such work in his problems. If persistent, he cannot fail to learn how to draw well. The important thing is to make the eye see the mistakes, the faults, in one's drawing; if a fault is understood it can be conquered. One cannot do good architecture without these freehand forms; they are used even in the simplest architecture, for the moulded profiles of column base, entablature or string courses. Profiles drawn with a compass result in hard and cheap looking work.

Those who find it difficult to draw well a statue, for instance, may use the method of "squares": divide the height of the statue chosen into an equal number of parts—use any convenient division on your scale, such as ⅛, ¼, or ½ inch,—and then by means of a 45° diagonal, draw lines at right angles, forming a series of squares, as in the upper left hand corner of Figure 68. Now, by dividing the height the statue is to have on your finished drawing into the same number of parts, and forming squares in the same way, the figure may easily be drawn by taking each square in turn and drawing the lines on your drawing that occur within this square on the document. See Figure 67.

Figure 67.

In Figures 68 and 69 are shown a number of statues at small scale, taken from Gromort's small book on architectural indication. "Petit Recueil des Eléments Décoratifs." Figures 70, 71 and 72, from the same book, show a number of vases, cartouches, balustrades and fountains, which the student will find useful in completing his drawing. All the examples are from existing work,

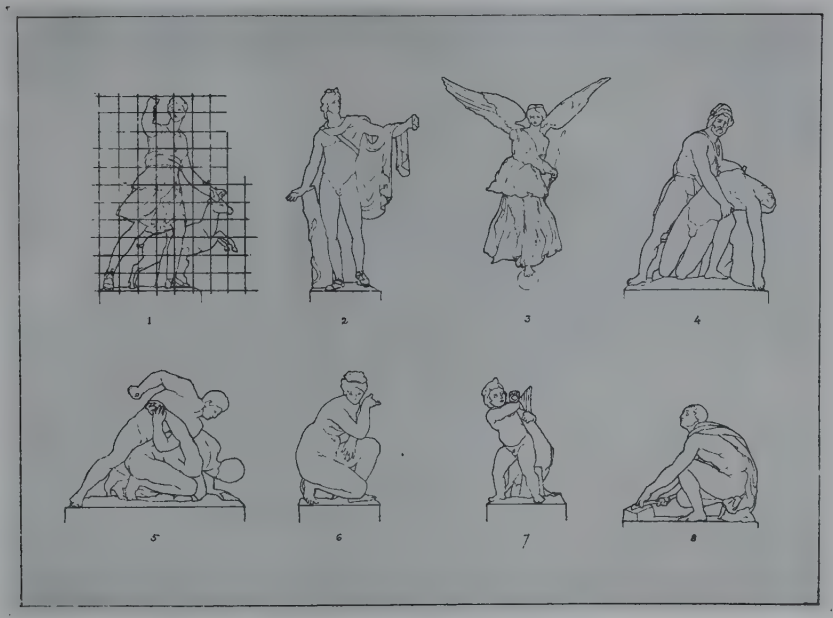


Figure 68.

Figure 69.

are exceedingly well drawn, and simple enough in indication to be used on small scale work.

If in inking a drawing a blunder has been made, a profile is poor, or a piece of freehand is not well done, do not be afraid to rub it out, using the "emerald" or "ruby" rubber and an erasing shield, and rubbing lightly; it is better to spoil the surface of the paper than allow an ugly piece of work to pass with your name on it.

I wish to say here something of lettering: good lettering improves a problem; if it is not well done—which means well spaced, well drawn letters of pleasing shape so applied as to aid the general composition — it is far better omitted. Granted one can judge between good and bad lettering, it is simply a problem of patience and usually resolves itself into a question of time: lettering should not be considered if there is not time to do it well. For the smaller sizes of lettering, perhaps the best results in least time is to seek letters of the proper size in a book of alphabets—such as Brown's "Letters and Lettering,"—and simply trace over them on a piece of tracing paper on which guide lines have been drawn at the top and bottom. In this tracing the spacing of the model should be utilized as much as the forms of the individual letters.

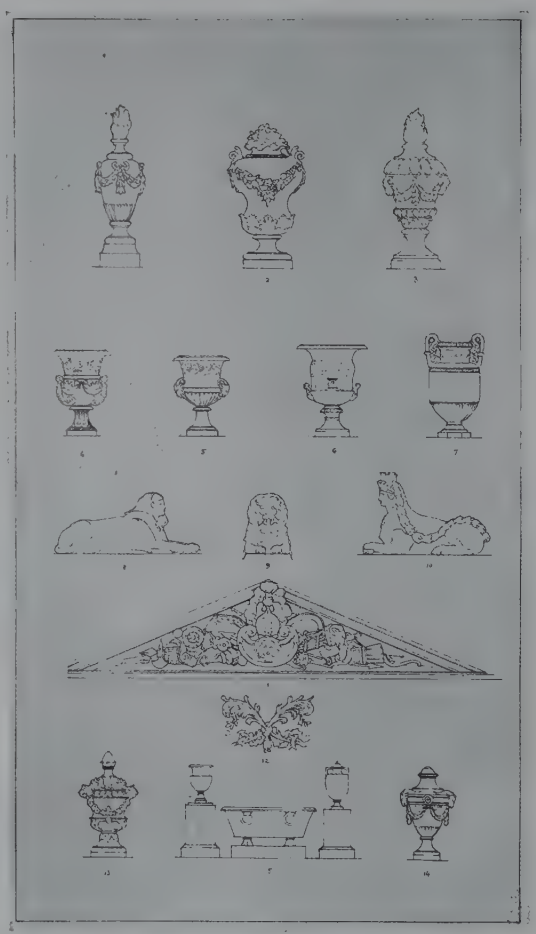


Figure 70.

When the drawing is completely inked in, it should be thoroughly cleaned, first by rubbing with a soft rubber or art gum—this must be done lightly so as not to injure the surface of the paper—and then with a sponge and plenty of water, sopping the sponge on the paper rather than rubbing it across the surface, for the reason just given. When dry, the shadows should be drawn with a well pointed pencil, and the stone joints drawn lightly in pencil if they have not been already done in ink. Care should be taken to avoid dirtying the paper, and the hands should not be allowed to touch it, as any body-oil that reaches the paper causes streaks and spots in rendering washes, especially if India ink is used.

The shadows *must* be drawn correctly, or sufficiently so to give the appearance of correctness. Many men fail of "mention" because the shadows are wrong, and there is no excuse for this when such good and inexpensive books as McGoodwin's and Millard's may be secured on this subject. The reason that accurate shadows are considered of such importance is that in the rendered geometrical elevation it is the shadows that explain the forms, that give the impression of the third dimension.

The "entourage," trees, bushes, etc., foregrounds and backgrounds, and figures, are frequently drawn at this time and left in pencil, studies being first made on tracing paper, with charcoal or soft pencil, over the scale drawing. The first requisite of these accessories is that they be well composed, in their relation to the rest of the drawing, and well drawn; it is better, too, that they be somewhat conventional, rather than realistic, as a geometric drawing is necessarily conventional. If there is not time to draw them well, they should be omitted, and a simply graded wash substituted. It is foolish to spend several weeks in studying an elevation, and then, a few minutes before starting the rendering, to sketch, hastily, distorted perspectives, ill-shaped trees and mountains, which entirely ruin the elevation. It is well for the beginner to use documents for such accessories—almost any magazine contains photographs of good examples. Figure 74 shows some trees and bushes conventionally drawn.

In using perspective for foregrounds the horizon should be placed at the height of a man drawn to scale, and the vanishing point found on this line as in Figure 73a. When this is too sharp—if paths are at the extreme side, for instance—it is well to use two vanishing points, equidistant from the center, as in Figure 73b.

In the analytique it is best not to attempt too much in the way of entourage. Especially is this true when the subject of the program is a portion of a large building, as in Figures 1 and 2, where almost nothing is used and yet anything added in these cases would detract, rather than help. Where the subject is a small complete structure, as in Figures 7 and 8, a little more in the way of setting is appropriate.

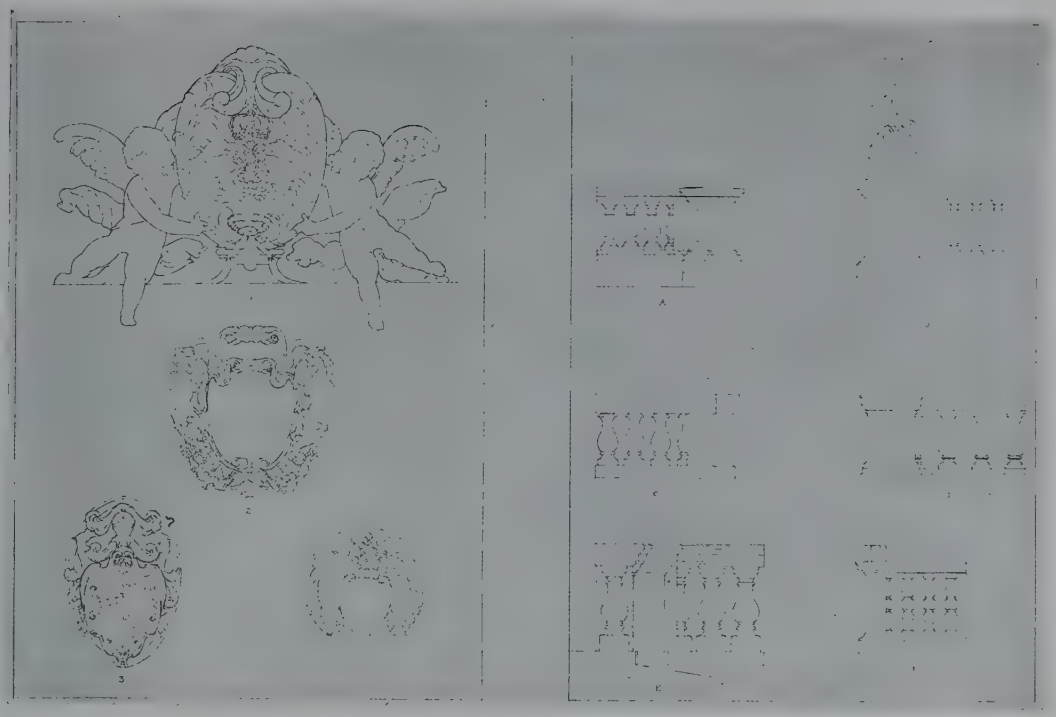


Figure 71.

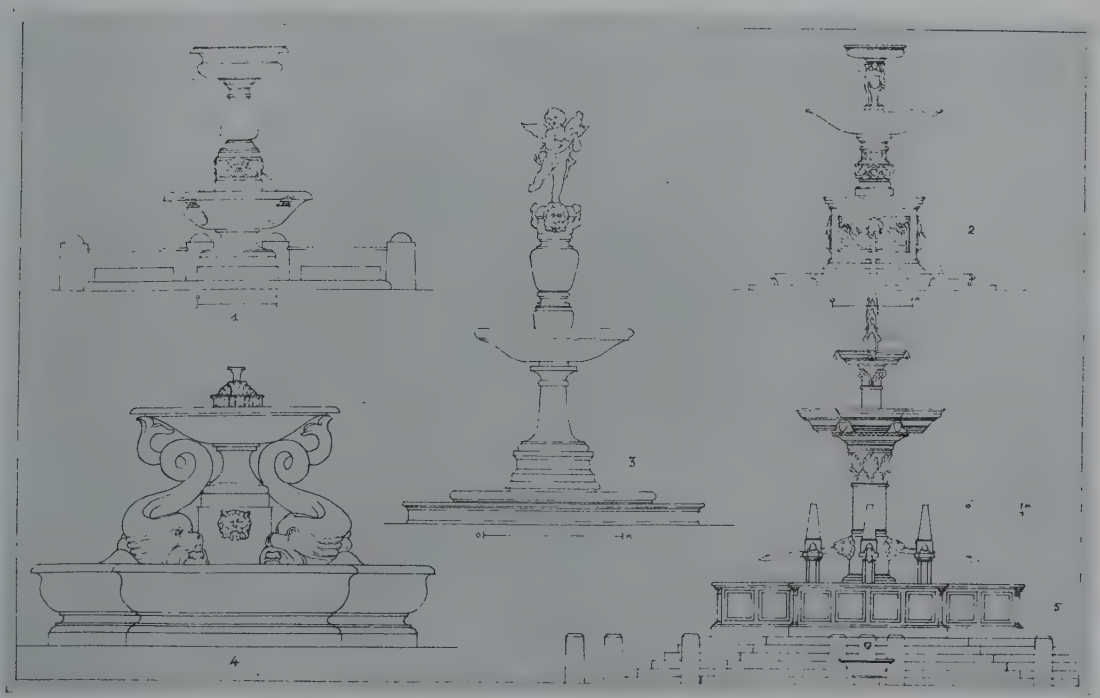


Figure 72.

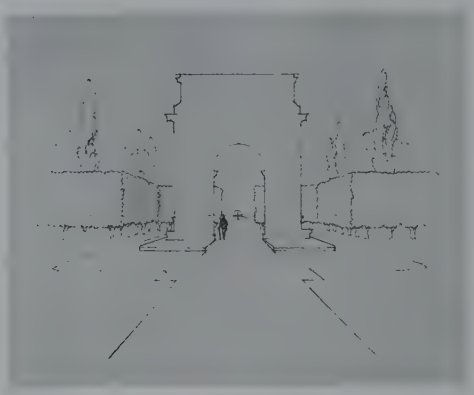


Figure 73a.

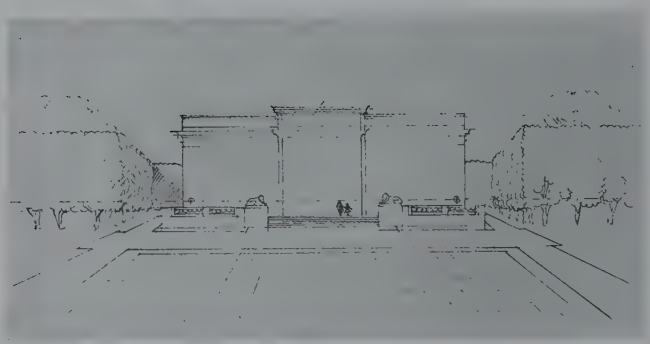


Figure 73b.

Figure 74.

Figure 75. Antique Fragments. From H. D'Espouy's "Fragments D'Architecture Antique." An excellent example for use in the rendering of the large scale details of the analytique.

Figure 76. Detail of Portico of the Pantheon at Rome. From H. D'Espouy's "Fragments D'Architecture Antique." Note how the mouldings are "modeled" by the "French" method, of bands laid with flat washes. The part of the mouldings at right angles to the "reflected" light rays are the lightest tones to be found within the shadows. This can be seen most clearly in the corona and the ovolo that is ornamented by the egg and dart. The modelling of the "eggs" and "darts" is done after the moulding is first modeled by the flat washes in bands as if it were an unornamented ovolo.

THE "ANALYTIQUE" OR ORDER PROBLEM

Chapter VII

RENDERING

THE analytique is completed only when it is "modeled" by rendering to express the form. There are many kinds of rendering: the wash of water-color is the usual method of modeling an architectural drawing, but the method of modeling is the same whether the rendering be with wash (water-color or India ink), pen and ink, pencil, oil, or mixed processes. All of these media are used in the drawings made by the men at the French Academy at Rome and published by D'Espouy as the "Fragments d'Architecture Antique." Figures 77 and 78 show two drawings, by Paul P. Cret, submitted in recent competitions, where a "detail" was required in addition to the usual drawings of plans, sections and elevations. The first is done in India ink, the other in pencil over a few washes of a water-color tone: they are modeled in precisely the same way.

Rendering does not have fixed rules—any scheme is good if the reliefs and forms are adequately expressed by it. However, there are some general principles which should guide the rendering, and if the student gains an intelligent understanding of these principles he will be able later to develop his own personal style of expression.

I have already spoken of the casting of shadows. It is universal to assume the sun's rays as following the direction of which the horizontal and vertical projections make an angle of 45° with the ground line. The ray itself does not make this angle but has the direction of the diagonal of a cube, – down, back, to the right – of which the sides are respectively parallel and perpendicular to the two planes of projection. This method has two advantages: the casting of shadows is made as simple as possible – which is well to consider, for at that the process is often long and complicated – and the widths of shadows are equal to the projections; consequently the size of the shadow explains, without any other drawing, the relief of one architectural member as related to another.

For the analytique a monochrome rendering is required. Though this is sometimes called a "monotone" rendering, it is, to speak strictly, a monochrome rendering, as many tones are used, but of one color. If India ink is used it should be freshly ground and strained or filtered. This may be done, as in Figure 79, by soaking a small piece of thick, soft white string in the ink, and then putting one end in a saucer at a lower level. All of the ink will pass through the string by capillary action. The great advantage of India ink is its transparency —the drawn lines are never lost. Its one disadvantage is that the tone becomes very much lighter when it has dried, so that frequently tones must be put on a number of times before the proper value is reached. It is also very difficult to sponge out India ink tones (the ink acts rather as a "stain" penetrating the fibre of the paper than as a "paint" remaining on the surface), so that one must proceed cautiously to avoid too dark a wash. As a result, rendering in India ink is a much slower process than rendering in a water-color monochrome.

Of the water-color pigments, one may use ivory black, or peach black (of French manufacture – other peach blacks have a cold, unpleasant color), or sepia, or a mixture of two colors, as ivory black and raw sienna, ivory black and cobalt blue, ivory black and yellow ochre, or ivory black and French blue (the latter if the drawings is at fairly large scale,

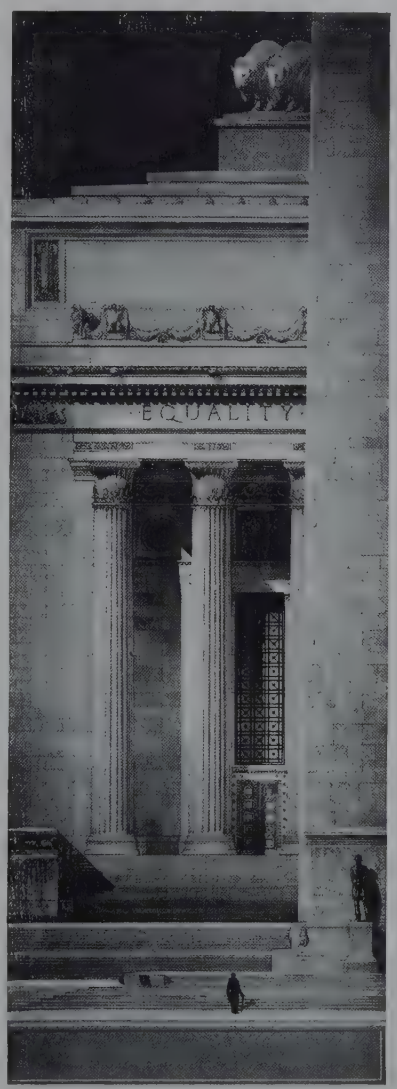


Figure 77.

otherwise the settlement is too great). Many other combinations are possible, of course. It is best not to mix more than two colors as there is a tendency for the pigments of varying solubility to settle unequally, and thus cause streaks in washes and changes of tone.

In any case, whether you use India ink, a single pigment or a mixture, begin by making a thick "soup" of strong color; from this dilutions are made for lighter tones in small saucers by adding varying amounts of water. This avoids a constant remixing of pigment; when a mixture of two colors is used it avoids a change in the tone; and there is always the strong tone of the "soup" for the small accents of dark color necessary when nearing the finish of the rendering.

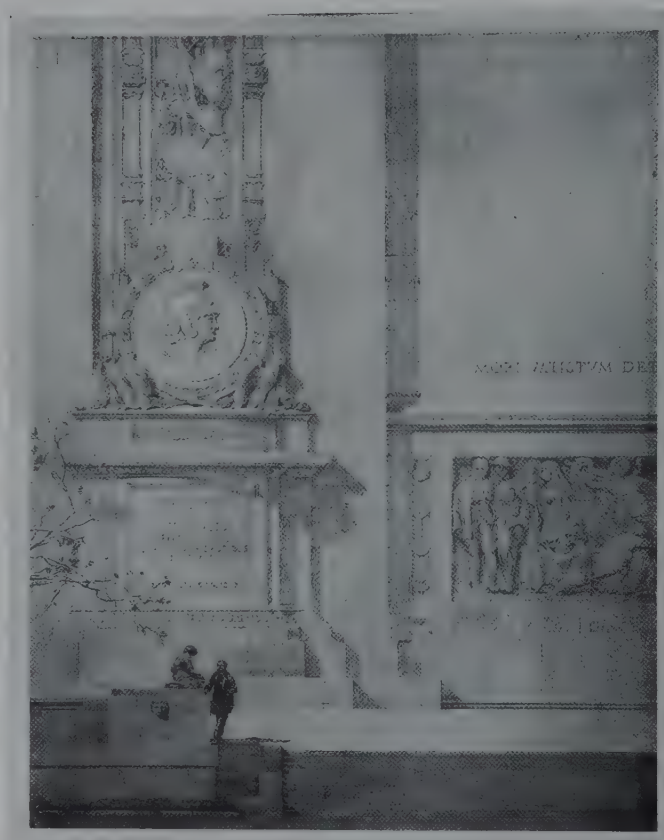


Figure 78.

The rendering should follow an orderly progress, and the work should extend to all parts of the drawing: it is very bad to render up one portion to a finish, and then another portion, and so on. A drawing so rendered will look like a mosaic of which the several pieces do not belong together. It is always best to run all the big washes first—all the general tones—and then gradually work down through the smaller ones.

In most renderings the first step is to run the "shadow wash," but for an analytique it is best first to run a wash over the large scale details, or "frame", to differentiate it from the small-scale picture. Now run the shadow wash in all the shadows—in the small-scale drawing and the details. Do not bother about the exact value of this first wash; it will in most cases be changed later; the important thing at first is to separate the light and shade. This distinction must always exist, no matter how much the parts in light and shade are worked up, there should always be the difference between light and shade.

Next, take the small-scale drawing and run washes in the openings, in the windows and doors, and in the sky if the drawing is one showing a silhouette. It is not necessary in any of these washes to get the final effect at first; usually this cannot be done, and later washes are added from time to time to

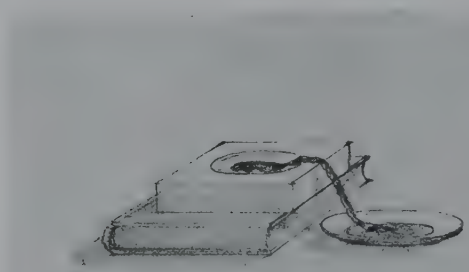


Figure 79.

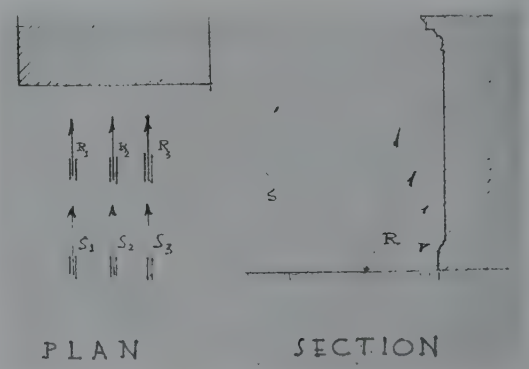


Figure 80.

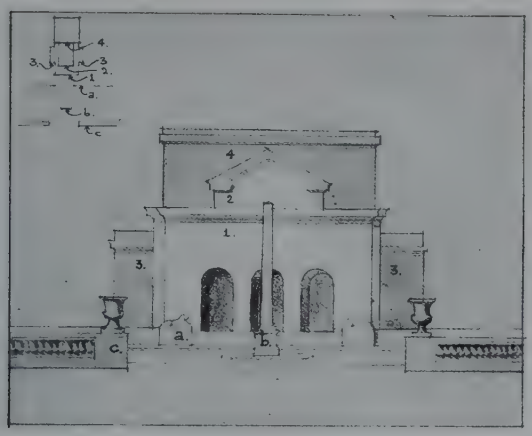


Figure 81.

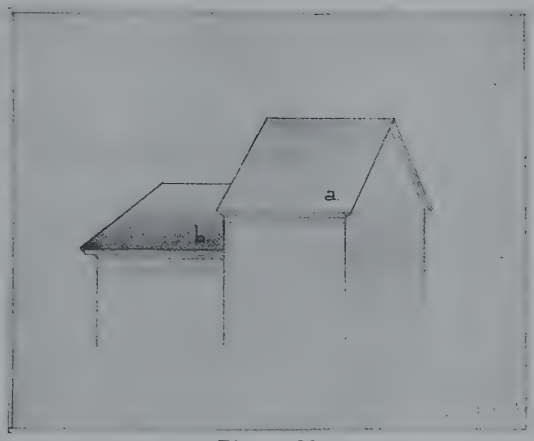


Figure 82.

keep the different portions in their proper place. It is essential, however, to keep neat edges on all washes, running them up to the bounding line, and not over it. When the brush does run over the line, it is well, as soon as the wash has dried, to soften such a place with a little water on the brush, rubbing gently with the brush, and blotting up with a handkerchief (preferably) or with a blotter.

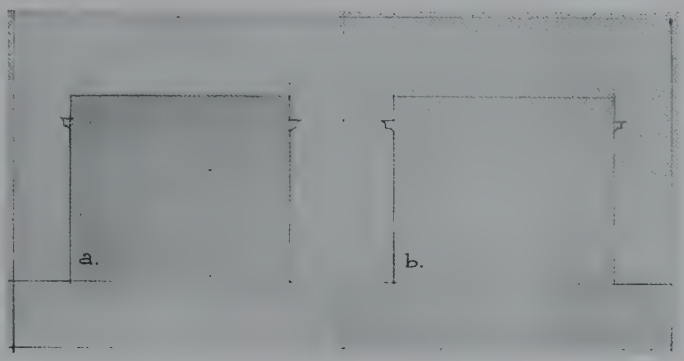


Figure 83.

Next, washes should be run on the vertical planes to give distance, to "focus" the drawing at the principal plane. As perspective illusions are not present in the geometrical drawing, the only resource to bring a plane forward or backward in relation to another is to tint it differently. An object nearby is strongly modeled; as it recedes it is less modeled; in the distance it becomes all one gray.

Thus, keeping practically white the portion in light of the important plane of the elevation, which we shall call the focusing plane — because it is on that plane we would focus a camera were we taking a photograph, and on that plane we shall focus our rendering—washes are placed over the vertical planes behind it, the washes being of darker tone as the planes become more distant; again as we come forward from this plane of focus we run washes over the vertical planes, making the washes stronger as the planes are nearer to us.

In Figure 81 the plane marked 1 is the principal plane, and planes 2, 3 and 4 are successively farther away (therefore the washes on these planes are successively darker); and planes a, b, c are successively

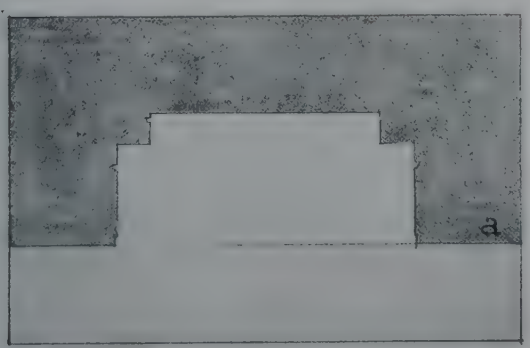


Figure 84a.

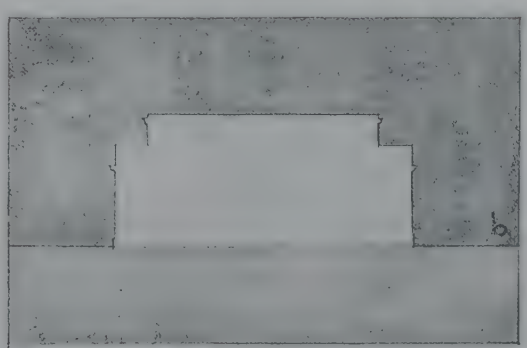


Figure 84b.

Figure 85. Detail of Temple of Mars, Rome. Restoration by G. Redon. From H. D'Espouy's "Fragments D'Architecture Antique." Note the rendering of the ornamented mouldings. See Chapter VIII.

closer than plane 1 (and the washes are made successively darker as the planes become more distant from the principal plane). If we now take the shadows on these planes, the shadows of plane 1 are in greater contrast with the surfaces in light; on planes 2, 3 and 4 the shadows show, successively, *less contrast;* and again the shadows on planes a, b, and c show successively *less contrast to the portions in light* of these planes than is the case on plane 1. *This is entirely irrespective of the strength of tone of the individual shadows in the foreground planes. These shadows may be darker in color than the shadows of plane 1—it is the amount of contrast to the portion of light of the same plane that is the important thing.*

In this manner the drawing is "focused" at the important plane. In Figure 81, I have used a large building with planes at great distances one from another in order to illustrate the principle involved: the analytique usually has vertical planes at very limited distances from one another — they are treated in the same way, the washes to separate them being only slightly different in tone.

The rays of the sun striking near the base of the building will cause reflections on the lower portions of the building of the colors of the ground surfaces directly near it. In Figure 80, the sun's rays are represented by S, the reflections by R; it will be seen that these reflections are strongest near the base of the building. For this reason the tones on the vertical planes may be graded. If the ground surface is a white pavement, the reflection will cause the face of the building to be lighter at the bottom, and a wash on this plane will be graded from dark at the top to light at the bottom, as at *a,* Figure 83. If the ground surface is grass, or a pavement of darker stone, these darker colors will be reflected on the lower portion of the façade, and the plane will then be rendered with a wash graded from light to dark, as at *b,* Figure 83. The grades in such washes should be very gentle.

These principles as to rendering vertical planes apply equally well to the large-scale details; the details may be put one behind another by light washes (see Figure 7). Also the various vertical planes in each detail may in the same way be made to take the proper distance from one another—the several members of a cornice, for instance. When a vertical plane contains ornament in low relief, in which the patterns of the background are as regular and as well studied as the patterns of the ornament (see Figure 39, frieze of Basilique Ulpienne), it is well to put a tone over this background to separate it from the pattern as well as to set it behind it.

The foreground of the small-scale drawing should be graded, getting darker as it comes away from the building, and it may be darker at the sides than in the middle. It should always be left fairly light, however, both because it is very well-lighted—as well as a vertical plane—and because the elevation must have a base upon which to stand. Thus, in Figure 84*a*, the building, always fairly white in general tone, has a white base on which to rest; in Figure 84*b,* where the foreground has been washed in darkly, the building has nothing to stand on and seems to be "floating."

Where roofs are shown, they should of course be rendered by graded washes. In a roof of steep slope the upper part—by contrast with the brightly illuminated background of the sky—will appear to be darker than the lower part. On the other hand, in a roof of slight slope, the distance from the eaves to the ridge increases much more rapidly than the height, and therefore the effect of distance is more important than the effect of contrast and a more satisfactory rendering will be obtained by darkening the tone of the wash near the eaves of the roof and grading toward the ridge. See *a* and *b,* Figure 82.

Note: In general, all washes should be graded: shadow washes should be graded rapidly, as reflected light soon cuts into a shadow as it gets further away from the edge which is casting it. For the rendering of shadows see next chapter.

Figure 86. Detail of the Temple of the Nike Apteros, Athens.
Restoration by H. Daumet. From D'Espouy's "Fragments D'Architecture Antique." Showing the "French" method of modeling used vertically on the flutings of the column.

THE "ANALYTIQUE" OR ORDER PROBLEM

Chapter VIII

RENDERING (Concluded)

I HAVE so far spoken of surfaces in light and surfaces in shadow, and pointed out that there should always be a strong demarcation between these two. But in rendering architectural drawings it is the modeling "within the shadows" that gives the aspect of the third dimension most quickly, and also gives to the rendering some of its most interesting effects. In countries nearer the equator the light of the sun is so intense as to obliterate all detail in the lighted surfaces, and it is only in the shadows that detail is seen. This is shown in the photograph of the colonnade of the Temple of Ammon, at Karnak, Egypt, Figure 87 on this page. Here it is seen that the modeling is almost entirely given by "reflected shadows" or "counter shadows."

An object or a building receives a variable amount of reflected light, independently of the illumination received directly from the source of light, the sun. The atmosphere, the ground, surrounding objects, etc., being illuminated, act as so many secondary sources of light of minor power. The reflected light issued from these sources is very subdued in comparison to direct light, and its effects will therefore be appreciable only in the portions of an object that do not receive direct lighting; in the same way as the light of a match, for instance, is not appreciable on the side of an object receiving direct light from the sun, but can be seen easily on the side in shadow.

Counter shadows are caused by light reflected from several sources, and it must never be forgotten that even in a conventional rendering, with direct light coming from one source only, there are always several directions of reflected light rays. The atmosphere has a varying reflective power which is maximum in a direction opposite to the path of direct light rays. With the sun assumed in the customary position, reflected light from the sky will be strongest along the diagonal of a cube, but in the opposite sense (up, back, to the right) to direct light rays. The reflecting sky may be considered as a hollow hemisphere, and the portions nearer the sun will supply the strongest rays while the rays of lower power will come from the portions more remote. This has as a result the reinforcing of the effects of direct light.

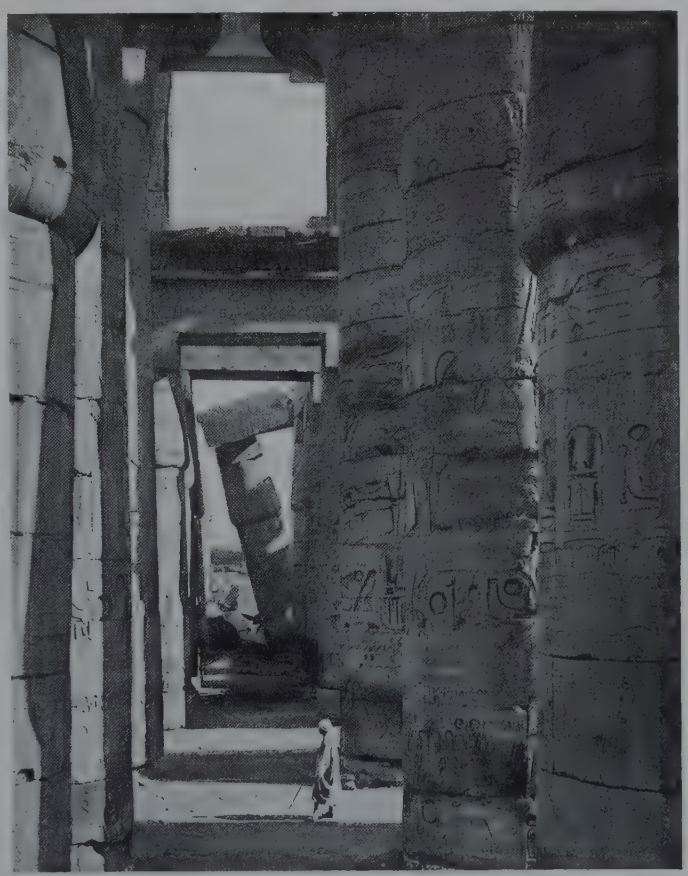


Figure 87. Karnak, Egypt, Temple of Ammon—Hypostyle Hall.

The ground is extremely important as a source of reflected light; its principal rays produce an effect comparable to the footlights of a stage. From Figure 88 it will be seen that *OP* is the normal direction of reflected rays illuminating the façade, and that any element of the façade

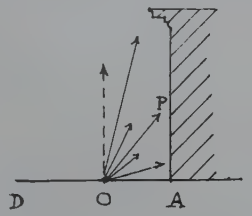
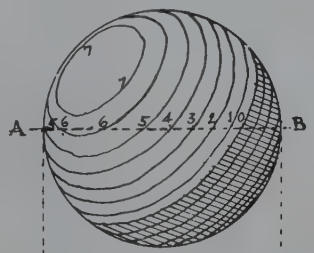


Figure 88.



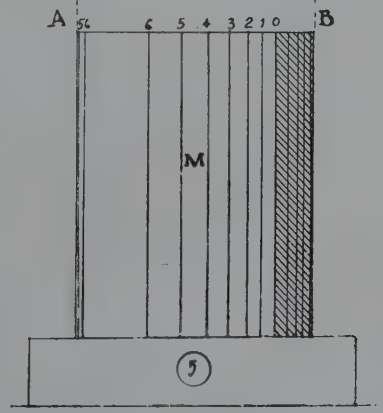


Figure 91.

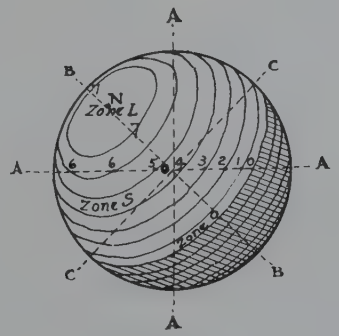


Figure 89.

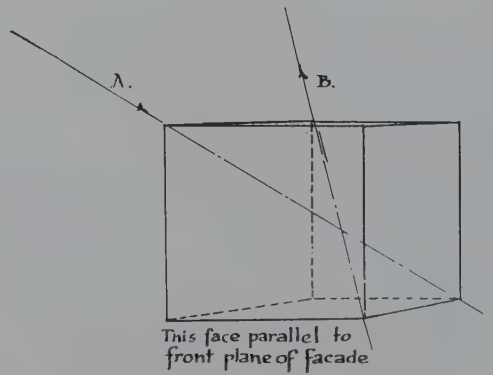


Figure 90.

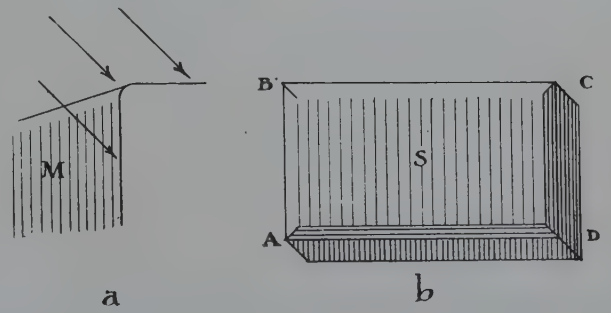


Figure 92.

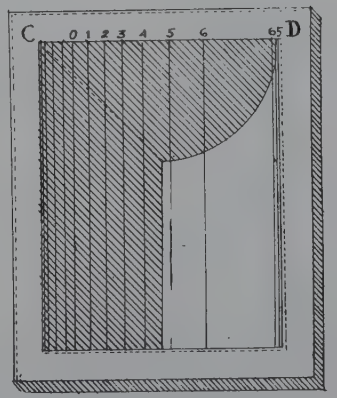


Figure 93.

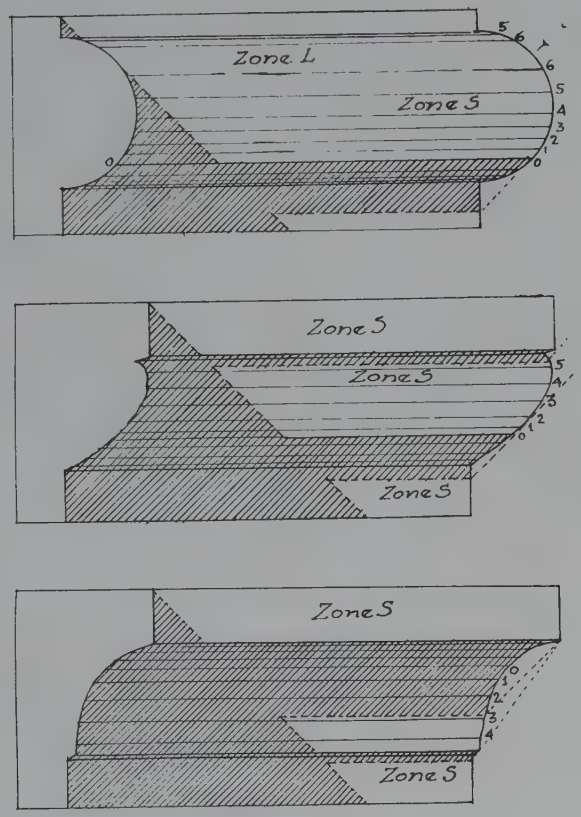


Figure 94.

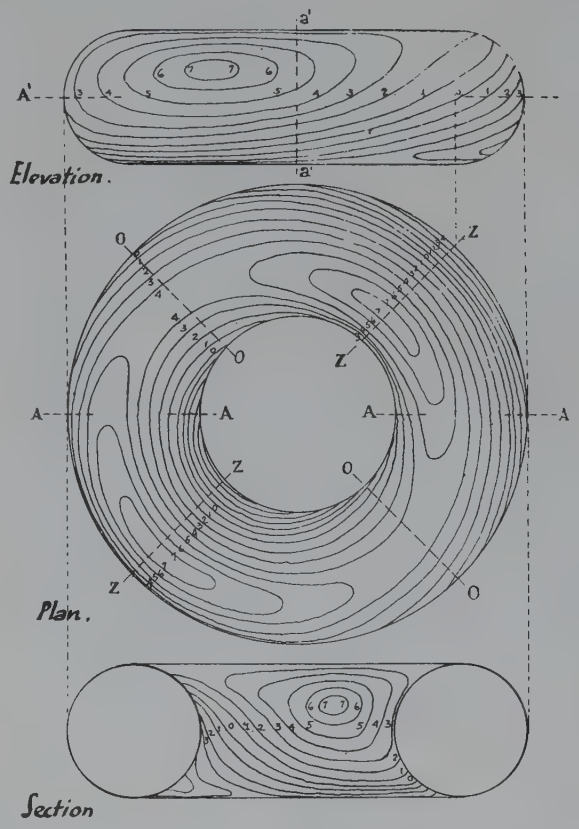


Figure 95.

Figure 96.

Figure 97.

(edges of mouldings, etc.) perpendicular to *OP* will receive the maximum intensity of the reflected rays, and also that the illumination from this source will decrease with the height of the building, the brightest portions being nearest the ground. For the effects of this principle in rendering see Figure 76, a rendered detail of the portico of the Pantheon at Rome, and the accompanying note. The mouldings there mentioned are perpendicular to the reflected ray *OP* in the diagram, Figure 88.

Figure 98. Villa Albani, Rome.

Three sources of reflected light rays have been considered: the general atmosphere, the sky considered as a hollow hemisphere, and the ground. Simplification of rendering leads to the combining of these in one direction, which has been selected as that marked *B* in Figure 90. It is the direction that has been assumed in most of the recent renderings where, for instance, the counter shadows of dentils or modillions are cast upward at 45 degrees from right to left. This convention is not much older than the middle of the Nineteenth Century. Previous to that time back-shadows were cast indifferently to the right, as in Figure 76, which is a restoration of the cornice of the portico of the Pantheon at Rome, by Daumet; or to the left, as in Figure 28, the detail of frieze from the Temple of the Sun, Rome, by Esquié; or from below vertically upward, as in Figure 26, also by Daumet, a detail from the Temple of Concord, Rome. It is best to adopt the direction of reflected light indicated in *B*, Figure 90, as it is now so general, but we must not forget its purely conventional character. In this diagram the direction of the direct rays of light is indicated by *A*.

In casting counter shadows it must be remembered that reflected rays from the sky or from surrounding objects interfere with the rays from the ground and that the outline of the counter shadows soon becomes blurred, and vanishes in the general shadow tone. The rendering by Esquié shown in Figure 28 illustrates this principle very clearly.

Shadows of all kinds are rendered by graded tones because of the effects of reflected light. A long vertical shadow, such as that cast by a column, is lighter in the lower than in the upper part, which is farther away from the ground acting as a source of reflected light.

Many shadows, direct as well as reflected ones, on the small-scale drawings and the smaller ones on the details, are most conveniently put in with the ruling pen, mixing the proper tone with the brush, which is then used to fill the pen. In the same way a free-hand pen may be used to put in back shadows and accents on sculptural reliefs or archi-

Figure 99.

tectural ornament. This use of the freehand pen and ruling pen may be seen in Figures 96 and 97, details of a competition elevation drawing.

Figure 100.

All plane surfaces are limited by edges: these are never perfectly sharp, but have a section similar to *a*, Figure 92. Therefore these edges will receive either a greater or a less amount of light than the surface *M*. In the case of a rectangular surface such as a quoin, Figure 92-*b*, the two edges, *AB, BC*, are illuminated as planes at 45 degrees (turned toward the sun), while the edges *CD, DA*, are similar to surfaces in shadow. It is the usual practice in drawings at small scale to treat all vertical surfaces like this quoin, but to neglect the rendering of *CD* and *DA*, while keeping a high light on the edges *AB* and *BC*, which are very bright in contrast with surrounding values. How this may be applied to a small-scale rendering is shown in Figures 96 and 97. Note how a high light has been left on the left-hand edge and the top edge (unless it is in shadow) of all the vertical surfaces. This has been a common practice in rendering details at large scale, or in the foreground, as in Figure 97. It is of just as much use in small-scale drawings if properly handled. Similarly, in rendering within shadows, just as reflected light will cause counter shadows, so will it cause lighted edges on the *lower* and *right hand* projecting edges, as shown in the rendering at the right of Figure 102, and in Figure 18.

In all rendering there are three big divisions of tone: the high-lights, left almost colorless, or rubbed out with a rubber between two strips of paper or an erasing shield: the half-tones, or general light tones of surfaces parallel to the front plane: and the shadows. It is well to keep this always in mind, for in rendering rounded forms it is only by dividing them first into high-light, half-tone, and shadow, that real expression of form is gained.

The architect's most usual problem in rounded forms is the column, and at large scale, as in the details in an analytique, the rounding must be done by the rendering. The simplest method, that called "French," consists in dividing the curved surfaces by lines "of equal illumination," that is to say, such lines as on all of their points the sun's rays make the same angle with the perpendicular to the

Figure 101. Detail of Temple of Antoninus and Faustina, Rome.
Note the rendering on the columns by the "French" method of bands of flat washes becoming darker as the surfaces in half-tone approach the shadow.

surface. These lines for various curved surfaces are shown in Figure 89, a sphere; Figure 91, a cylinder; Figure 93, a hollow cylinder or niche; Figure 95, a torus; and Figure 94, various mouldings. All of these figures are divided in the same way; for instance, Zone *L* or *7* is the high-light, Zone *S* or 4-5 is the principal half-tone or surface parallel to the principal plane in elevation, and *O* is the line on the surface where the light ray is tangent. All of these figures are derived from the division of the sphere, made by Pillet, Professor at the Ecole des Beaux Arts, in his book on rendering. Figure 91 shows how the zones are transferred from sphere to cylinder, and also that Zone 7 does not occur on the cylinder, its highest high-light corresponding to Zone 6 of the sphere.

In rendering these forms the depth of the wash run in each zone depends upon the amount of light received. A column so rendered is shown in Figure 101, from D'Espouy. Once the principle is thoroughly understood the lines may be omitted, and a graded wash substituted, as in Figure 129. Vases and other more complicated forms are rendered by an extension of the same principle. The line of shadow and the high-lights should first be found, and the portions of true half-tone marked; with those toned in first, the rendering will not be difficult. Figure 75 contains a number of such forms cleverly handled. Frequent drawing of architectural detail in charcoal from the cast is of great value in developing this sense of high-light, half-tone, and shadow. Compare Figure 100, an acanthus scroll so drawn, with the rendered one in the frieze in Figure 28.

Trees are also only an extension of the principle of modeling rounded forms, and again the high-light, half-tone, and shadow should be sought for. For such work the best document is a photograph from nature, as Figure 98 from the Villa Albani at Rome, or still better, sketches made by oneself from nature.

For hedges, a more conventional rendering may be used, as they are conventional forms. One good and easy method is illustrated in Figure 99, which shows the successive steps, most of which are done directly with the brush. Starting with a light pencil line at the top, and one where the foliage stops and stems show, *a;* a first wash, *b,* will give the tone to be left in places as a high-light, and it is put on with some freedom at the top to give the serrated effect of small leaves; next, the half-tone wash is put on, *c,* – it may be put on in several washes – with still more freedom than the last, an attempt being made to draw with the brush the general masses of leaf forms; this will give a very fair representation of leafy texture to the hedge. Finally the shadow tones may be put in, primarily on the stems and along the lower edge of the hedge, *d.*

For all rendering, a constant observation from nature is the first and last word to be written, and the greatest opportunity for development in one's style. A study of good renderings will give many ideas of value, the more so if compared with effects in nature.

From time to time during the rendering it is well to stand it up and look at it from a distance of eight or ten feet to take note of the general impression, to be able to correct any tendency toward overdoing a portion, or underdoing another, that would destroy the effect of the sheet as a composition. If a part is heavy, or badly rendered, sop it gently with a wet sponge until most of the color is removed, and then render it again. Try to keep always in mind the "effect" you are striving for. The best renderers visualize the effect desired before putting brush to paper. An examination of the published work of former Beaux-Arts Institute problems will aid this visualization, and if one among them is chosen as an example it may be compared with your work at the times just mentioned for looking at the sheet as a whole. Always bear in mind that the chief object is to express adequately the third dimension.

Do not cut off the drawing until it has thoroughly dried, otherwise it will have a very untidy, crinkled appearance; if possible, arrange for a suitable border on the same sheet, preferably white with a few ruled lines on it.

When the drawings are judged in New York, about 30 per cent usually fail to receive a "mention." Of the others, a very few—less than 10 per cent—receive higher awards than "mention." So "mention" is given to the *bulk* of the work. But do not be satisfied to receive only "mention." It is possible to pass up through Class B into Class A and through Class A on a series of "mentions." But such a record indicates commonplace, uninspired work, and it is better to stop, examine the work that is premiated—as it is published—and compare it with your own. See what is lacking, so that it may be improved. If you have not done better than "mention" in analytique, stay there until you do better before attempting the plan problems. Go to New York to an exhibition of Beaux-Arts Institute work if you can, or arrange for some of the drawings to stop at your atelier on one of the travelling exhibitions arranged every year. All drawings lose in reproduction, and an examination of original work will give many helpful ideas, especially as to presentation, not noticeable in a half-tone reproduction.

It is rather hard work taking every problem in sequence, especially if one is working in an office and does atelier work at night. It is a good idea, however, to *take every esquisse,* for that in itself is a mental training of great value, because each Beaux-Arts Institute program is written as part of a general scheme of architectural training, and the esquisse requires very little time.

The student should take, also, each sketch problem, for it is only by constant practice that one can do these well, and the earlier the start, the surer the progress, other things being equal.

We have put all notes as to sketch problems under the head of "The Sketch Problem and Prize Problems," and it would be well for the student in the analytique to turn to this part of the book and read over the first chapter for a general idea of the differences between the sketch problems and the regular projets.

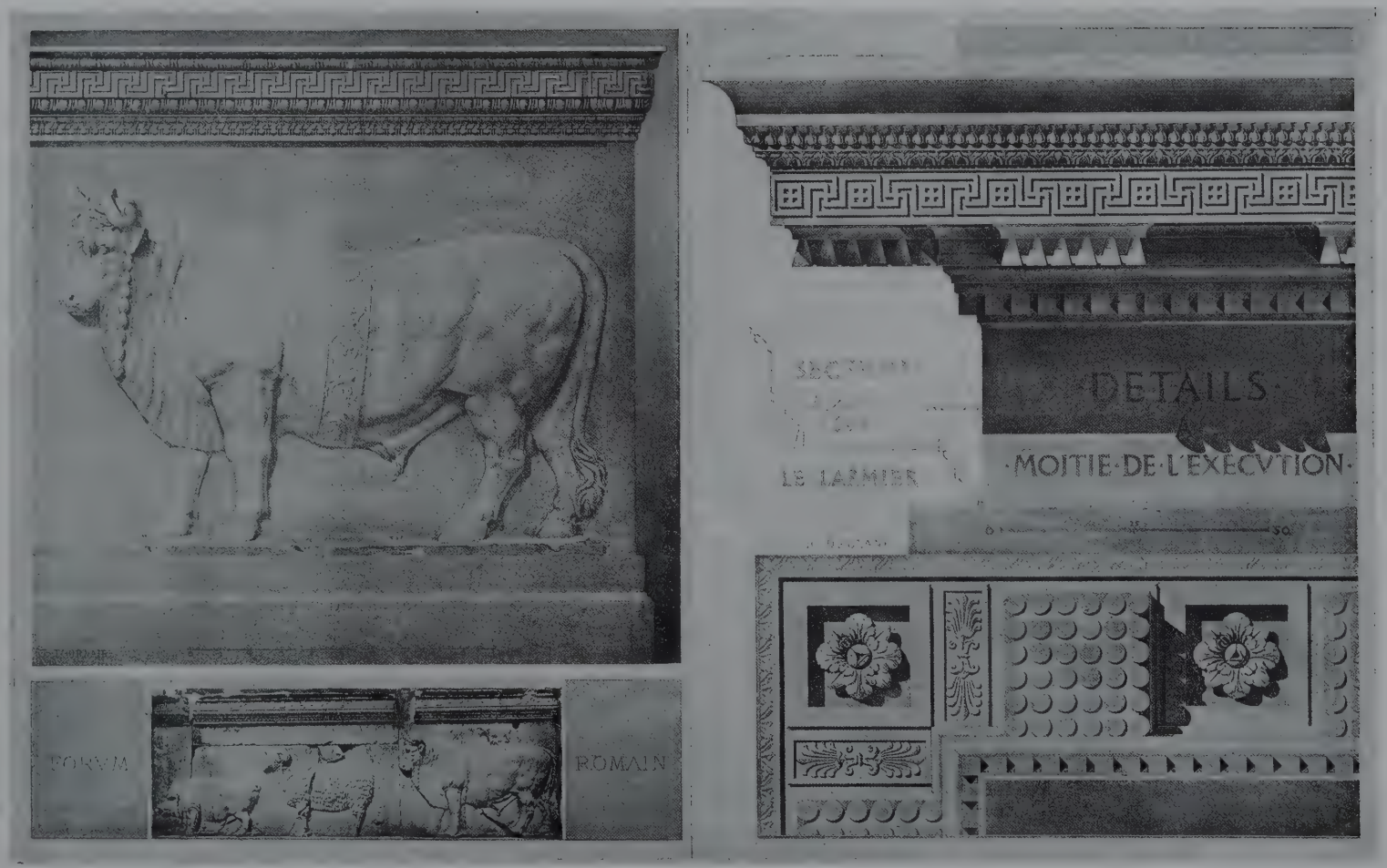


Figure 102. Fragments from the Roman Forum. Restorations by H. Deglane and J. Tournaire, from D'Espouy's "Fragments D'Architecture Antique." In the detail at the right, note the rendering of the reflected high-lights on the lower edges of the bed-mould.

THE CLASS B PLAN PROBLEM

Chapter IX

THE "ANALYTIQUE" AND PLAN PROBLEM COMPARED

WHEN a student has received the required values in the "Analytique," or when he has done such work in that class as to feel qualified to advance, he will take the Class B "Plan" problems. In this case the study of a plan of a complete unit is begun, although the work is not confined to plan, and the study in elevation is continued, and in some problems – interiors – study is made largely by means of sections.

The "elements" of architecture, which formed the basis of programs in the analytique competitions, are now but incidentals in a larger study. There is indeed a great difference in the work in the two classes, and it is for that reason that I suggested that the student advance from the one to the other only after having received a sufficiently good award in the Analytique to justify his feeling prepared for bigger work.

Let us see what these differences are, using an example of each for illustration, Figure 104 "A Mausoleum," being the Analytique, and Figure 105, "A Yacht Club," being the B-Plan problem. These are each excellent pieces of work of their class.

In the first place the plan problem is presented at a smaller scale. This means that drawing, as applied to a careful representation of mouldings, etc., will play a much less important part than in the Analytique, and that "indication" will play a greater part. Of this there will be further mention. It should be said here, however, that this change will emphasize the value of ability to draw "freehand," and that any training that will develop this ability, whether it be by tracing documents rapidly or by sketching from nature, or drawing from "life," will be immeasurably valuable to the Class B man.

Then, too, the plan required in the Analytique is usually very simple: sometimes, as in Figures 1 and 7, simply a section of a single wall with openings in it. The plan of the Class B problem is usually a grouping of several rooms, as in this case, (Figure 105), or of other "units" of plan, as in Figure 107, where some of the elements are unroofed. In short we might say that the Analytique is almost a study in two dimensions, while the plan problem is a study in three; that for the Analytique the principal studies were made in the dimensions of length and height (i.e., elevation), while for the B Plan problems the first and determining studies are made in the dimensions of length and width (i.e., plan), the third dimension of height not being of primary importance until the plan has been brought to a possible solution. This means a dif-

Figure 103. Class B Problem, "A Spring House," by R. Bailey.

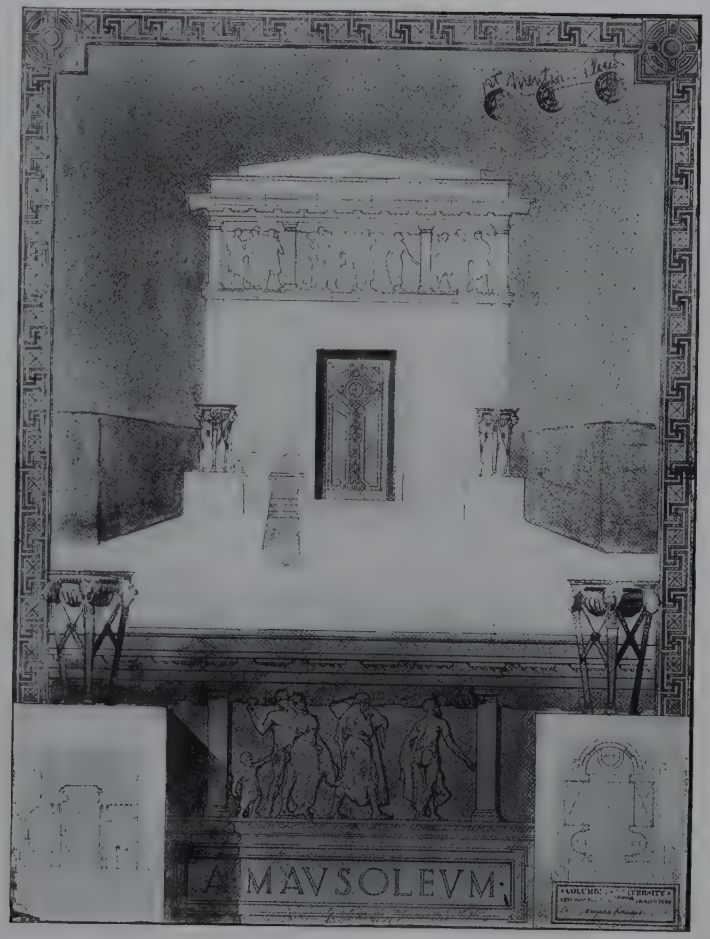


Figure 104. Analytique, "A Mausoleum," E. Kronish, Columbia University.

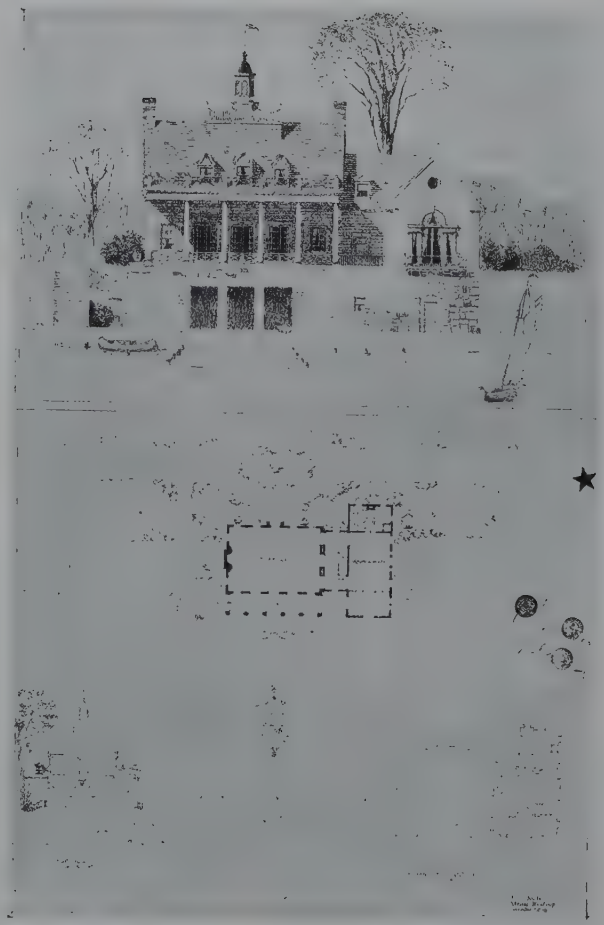


Figure 105. Class B Problem, "A Yacht Club," Louis Kurtz, Atelier Wynkoop.

ference from the very beginning of the problem, – the esquisse. The esquisse becomes even more of a mental training than before, for in the limited time in which it is made, a "scheme" must be found – the author's suggested solution to a given problem.

To do well a B Plan esquisse one must learn the essentials of planning a small composition. The program given calls for certain requirements; there may be only one, or there may be many ways of satisfying these requirements. *Any arrangement of forms may be considered a solution if it answers the requirements of the problem.* If it does not do this it is not a solution, no matter how clever in indication, nor how clever the arrangement of forms into what appears to be a "beautiful plan." A solution of one problem usually cannot be taken bodily and made to do service as the scheme for a different set of requirements, and when documents are used for a study of scheme and plan arrangement, the program of the example should be read at the time the plan is examined.

The program calls for elements of different size and of varying importance; it stipulates the size or shape of ground that may be used. The student makes his own grouping of these elements. The making of an esquisse is a rapid-fire process in which one must depend upon well-trained habits of thought, so that one does instinctively certain things that have become recognized as good. To do these things instinctively one must be trained in general principles; these one may think over and study beforehand – between problems. At the time of taking the esquisse there is no time for such general study; one must depend then on training.

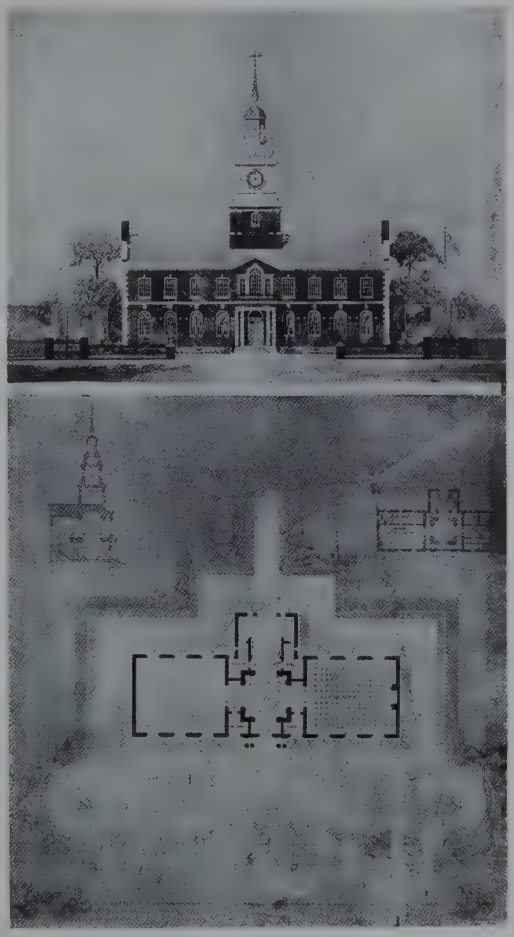


Figure 106. Class B Problem, "A Building for a State Historical Society," J. Weston, Atelier Hirons.

Of these general elementary principles as to planning an arrangement of architectural units I will mention:

1. Size, and Scale. In the Analytique we learn that some elements, such as steps and balustrades, vary only slightly in size. For work in Class B plan one should know the size of a number of good examples of rooms of various kinds, of small façades, and of "circulations," that is, lobbies, corridors, loggias, etc. These will furnish a standard by which the requirements of the program may be fitted. Thus, if the program calls for a *large* lobby, we realize that it should be larger in size than the usual examples, larger in scale and in treatment. We should also know, from the study of documents, how many "motives" can be put in a given length of façade; how many arches in a loggia of a certain length; how many openings in so much wall, etc. We shall in a later chapter go further into this question of sizes and of scale.

2. "Character" in the "parti" or scheme as well as in the treatment of façade. Will the program be better suited by a formal or an informal scheme? It may be symmetrical and yet informal, as in Figure 103, or it may be unsymmetrical and formal. The unsymmetrical informal scheme, as in Figure 105, or the symmetrical formal scheme, as in Figure 106, are more usual. In any event the solution of a problem must be fitting in character; fitting, that is, from the standpoint of the program and its requirements.

3. "Parti" or Scheme. This is, of course, the most important item in design, and it is to learn something about "parti" that one takes the B Plan problems; in other words, in studying each problem one is learning how to approach later ones, how to take the esquisse for them; for at the time of taking the esquisse it is the working of one's own brain, training, and memory, that must be relied upon. In the next chapter I shall have something further to say of "parti" and plan composition. At present I shall only say that the necessary qualification of a "parti" or scheme is that it shall satisfy all the conditions of the program; that the scheme shall "work" is absolutely essential. I would point out here, however, that having made a bad esquisse, one which on study proves to be an unsatisfactory

solution, there is nevertheless a great value in carrying the problem through to a finish. It is much harder work than studying with a good esquisse, and the constant need for ingenuity to counteract the bad qualities of such an esquisse, to make a workable solution from an unworkable esquisse, without incurring an H. C. for change from esquisse, is a real training for the problems of office work, where site, questions of construction, or the idiosyncracies of a client frequently prevent an easy "parti" and call for a display of ingenuity.

4. Open-mindedness. In order to develop ability in arriving at a "parti," one must be willing to try all possible schemes, and not be satisfied with the first that suggests itself and seems to meet all requirements. Figures 108 and 109 are different solutions of one program: they each satisfied all conditions. The proper attitude in making an esquisse for any problem is to visualize all possible solutions, and then to choose the best; or if no one stands out as such, as is the case in simple problems, then to choose that solution which is most interesting to oneself, as its development will tend to make one use his best talents. But always there should be an effort to set down a number of ideas: Class A problems, with their complicated requirements, will always have more than a single possible parti, and it is necessary to start early the mental habit of searching for a good parti.

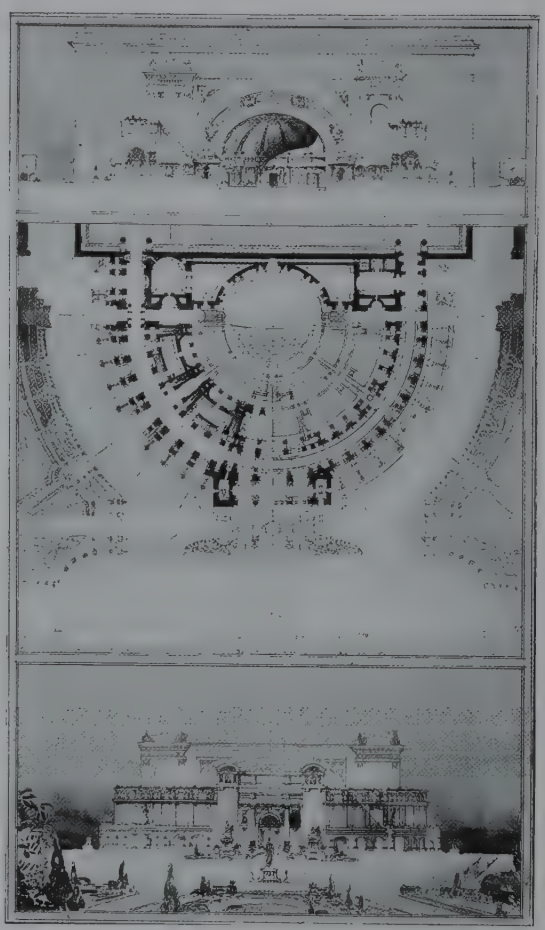


Figure 107. Class B Problem, "An Open Air Theatre," Jack Sanger, Atelier Hornbostel.

5. Indication and the meaning of "mosaic" in plan composition. How these effect the conception of a "parti" and may be used in making the studies for an esquisse will be spoken of later.

* * *

For the B Plan problem, as for all problems, a schedule should be made out as suggested for the Analytique. Certain new elements will now have to be considered in its formation. The section and plan are much more ambitious in size than in the Analytique problems, and so more time must be allowed to draw and present them. And if a color rendering is to be made, a certain amount of daylight should be provided in the schedule for this purpose, as yellows can not very well be judged by artificial light. This usually means that the Saturday afternoon and Sunday before the problem is due are set aside for rendering, the nights of those days being utilized for finishing the drawing of section, usually presented more simply than the other drawings, and for the more mechanical parts of rendering. If a problem is of the kind that allows a simple parti – a garden problem, or one where a study of elevation is called for rather than of plan,– it is often possible to have one drawing ready for rendering of its big planes on the Saturday and Sunday one week before the problem is due. Ornament on mouldings, or in panels, stone jointing, etc., can be put on, in this case, after the rendering has thus been started.

For the time spent in studying the problem, a first portion should be set aside for studying the scheme, developing the plan until it is a workable solution of the problem. When this is attained, the elevation, section, and plan should all be carried forward by turns, so that they will be consistent with each other, until near the end of the problem, when the most important drawing (the one so indicated by a reading of the program) may be advanced more rapidly so that advantage may be taken of any "niggering" that can be had from others in the Atelier. If an effort is made to work a schedule for the first two or three problems, the method will prove its value in the later ones.

Make as much use as possible of any available niggering. In the Analytique help came usually from those with more training—from the man in Class A or Class B plan. Now it is also possible to call for help from those in the Analytique class, men who know much less than you.

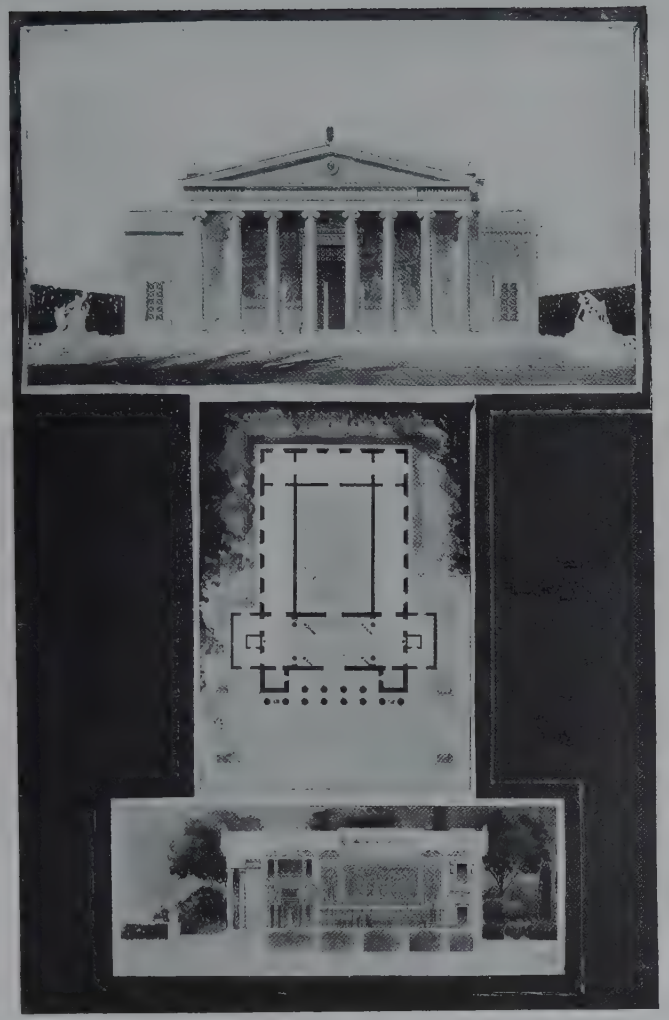


Figure 108. Class B Problem, "A Small Memorial Art Library and Museum," E. Eastcourt, Atelier Hirons.

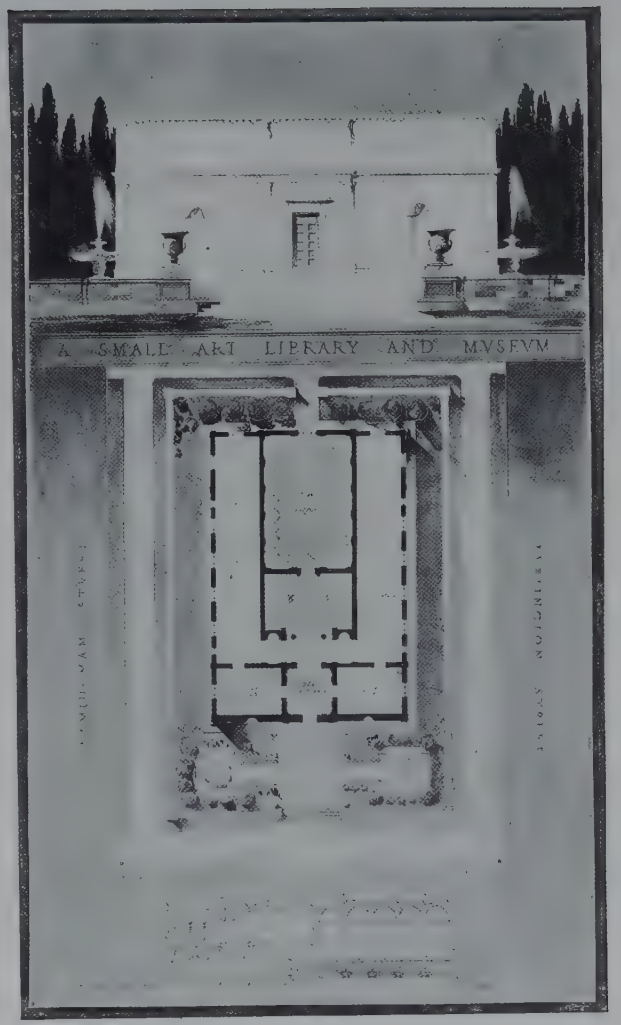


Figure 109. Class B Problem, "A Small Memorial Art Library and Museum," L. Williams, Columbia University.

Figure 110. "A Small Hôtel de Ville," M. Favier, Atelier Laloux, Ecole des Beaux Arts, Paris. An interesting study of "poché."

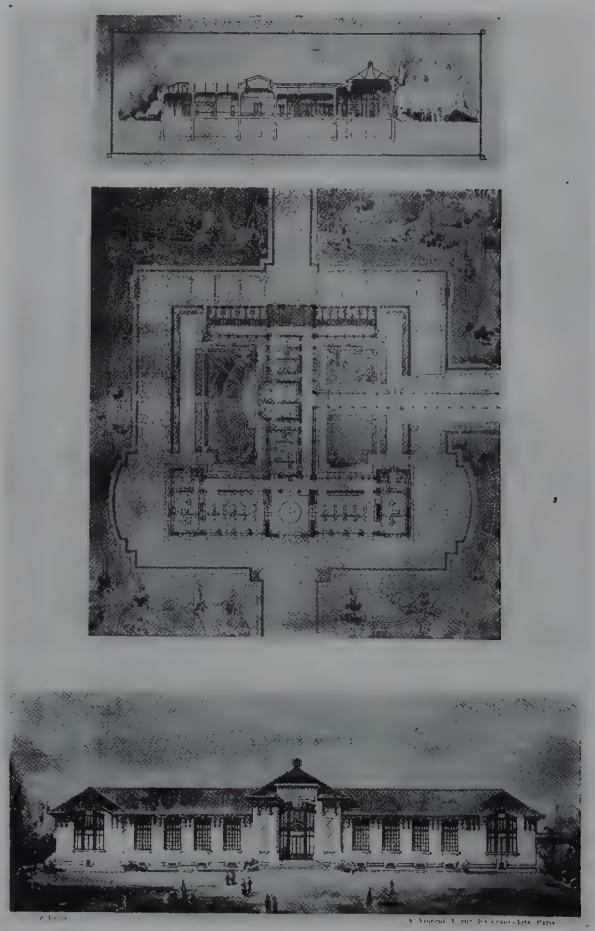


Figure 111. "A Building for Consultations at a Hospital," M. Maurice Stein, Ecole des Beaux Arts, Paris.

THE CLASS B PLAN PROBLEM

Chapter X

THE ESQUISSE

WHEN the student makes his esquisse he shows in sketch form the best solution he is able to suggest in the short time allowed for this purpose after he has been given the program. This solution is his "parti". Other students will of course have sent in esquisses showing, among them, several different "partis." Now, what is a "parti"? The word is a French one and is used in architectural training as it is used in the ateliers in the Ecole des Beaux Arts, at Paris. The dictionary gives as translation: "Parti—party, choice, way, means....method." Professor Paul Cret* in answering this question said: "Parti means party, just as in politics there is a Republican, a Democratic Party; one has to be selected by the voter, who does not know which one is going to win, so, selecting a parti for a problem is to take an attitude toward a solution in the hope that a building developed on the lines indicated by it will give the best solution of the problem."

In this the first requisite is common sense: schemes too ambitious for the program or otherwise inappropriate as a solution must be discarded. One must have some knowledge of the general class of buildings, of which the program calls for one. This means, of course, that the new student is at a disadvantage compared to the more experienced man, until he too begins to learn something of architecture: this is true of life in general.

There is usually an announcement beforehand of the field in which the problem will lie; this gives the student an opportunity to make some preparation. For instance, if the problem has been announced as "a small railroad station," one can look through architectural magazines or other publications for the general handling of such a problem, *comparing* the various solutions he sees. It is a mistake for a student, instead of making such comparison among several examples, to *memorize one example* that appeals to him, and put it in his esquisse, for the programs seldom repeat exactly the requirements of a former problem or example of executed work, and the difference makes the memorized solution a misfit. This is simply another instance of the need of common sense.

Study your program when you receive it to see what is essential; to see what elements are needed, what elements that would be needed in a large example could be dispensed with in a small one. In doing this, put yourself in the place of the ones using the building: "what is the easiest way to accomplish what I have to do in that building?" For instance, if the problem is a railroad station, visualize yourself going through the different processes of a railroad station, and you will be much more apt to put the ticket offices, baggage rooms, etc., in places

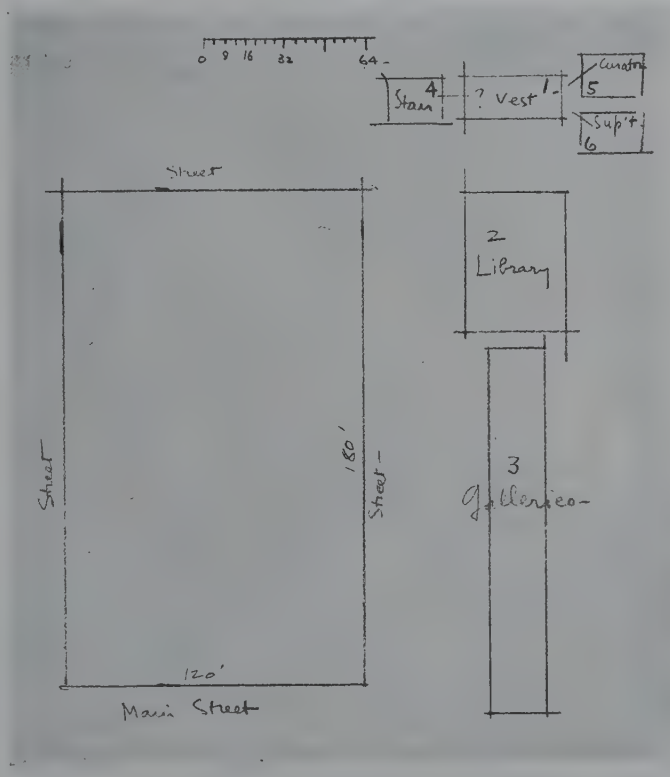


Figure 112.

At a talk on "Parti," in which he outlined very much what follows. This was given at the T-Square Club, Philadelphia, September 22, 1921, by Paul Cret, A. D. G. E. (Atelier Pascal), Professor of Design since 1903 in the School of Architecture, University of Pennsylvania.

that will suit their uses than if you considered the problem in an impersonal way. It will help you in making your esquisse, and if the esquisse is made with such a method of thinking, though it may be bad in proportion, if the several rooms are in the right order, their relation to each other can be improved as the study develops.

To make a good esquisse it is necessary to have a general knowledge of the kind of buildings that an architect is called upon to design; it is good training to study real buildings to see what "the crowd" is doing in them. If you notice that in one kind of building certain of its parts are easily crowded you will note that those parts should be kept large. If you watch a crowd you will understand why a "circulation" should not be crooked so that people will lose their way. A domestic building is different from a public one in this; its occupants know the building and know one another, therefore an irregular plan with a circulation that is not very direct is quite satisfactory. In designing a public building, one must assume the crowd rather dull-witted, and the circulation in such a building should be arranged simply, so that those who use it can easily find their way about.

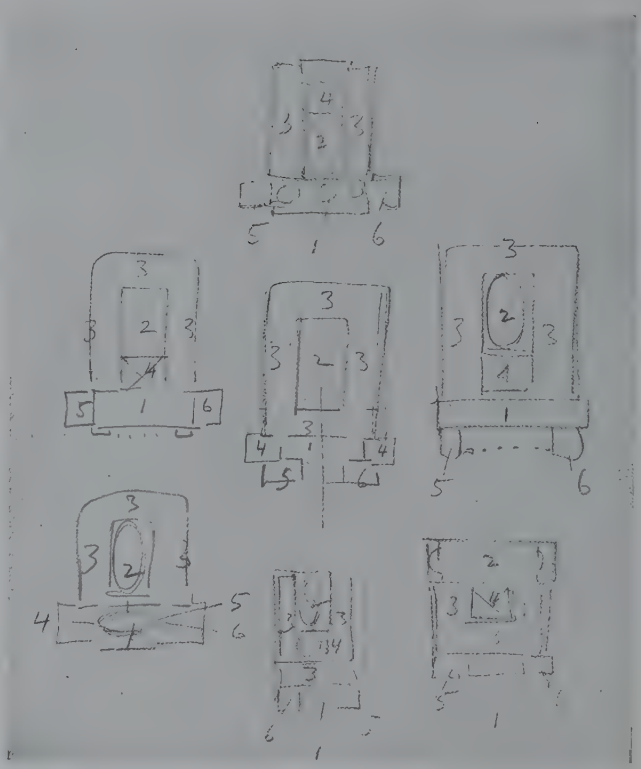


Figure 113.

Figure 114.

Try to understand from the program what kind of a building is called for so that the solution you suggest will not be unsuitable. If the problem is for a small suburban railroad station, do not make one suited to a city street, or "big" in scheme.

Usually there are special conditions in a program that will affect the problem. If "A Bank" is the problem, the program may state that it is "on the corner of two streets," "on a wide avenue" or "on the second floor"; in each case there would be a different solution—an esquisse good for one condition might be quite poor for another. Peculiarities due to the site or geographical location, if mentioned in the program, should affect the selection of a parti. A building in the South would receive quite different treatment from one in the North. If the ground is said to be "on the side of a hill" or "facing a view," certain conditions are thereby imposed on the problem which make it different from another. Sometimes a small word in a program, seemingly casual, gives the key to an original solution, or to the only solution that is good.

Therefore, when you receive your program, read it through carefully — *several times* — to allow its different conditions to enter your mind before you attempt to form any solution. Think about the problem before starting to draw. The title will give the first clue to follow. If it is "A Bank," ask yourself, "What is a bank? What are the principal elements of a bank?—of these elements which are the most important? What others, while not monumental, are nevertheless important in the working of the bank and require large areas—such as space for bookkeepers, clerks, and accountants?"

Then read the list of requirements: this gives an idea of location, the importance of the different rooms, type of architecture, etc. In a good program no word is useless; each word has a bearing on the particular problem. In studying a program, try to find out the spirit of it—what its author really meant.

For problems other than ones in domestic or picturesque—or perhaps, religious—architecture, an unsymmetrical scheme should not be used unless the program makes it necessary. When the conditions of the program, however, are such as not to be divisible on two sides of a main axis, then the unsymmetrical solution will be a necessity for a good plan.

Sort out the requirements of the program: select those which are important, and put the others in

groups—those used by the public, those used only by the staff of the building, etc. This grouping will aid the student in arranging the elements of his plan so that the chosen parti will "work," that the important rooms will satisfy the needs of the public in the building, that the lesser rooms will work with each other and with the principal rooms and that they can be reached easily without causing the circulation used by the staff to interfere with that used by the public. This question of circulation is very important, as it is the circulations–the entrance halls, corridors and passages – that tie together the different parts of a plan. It goes without saying that the principal element – the heart of the program – should be in a position of importance.

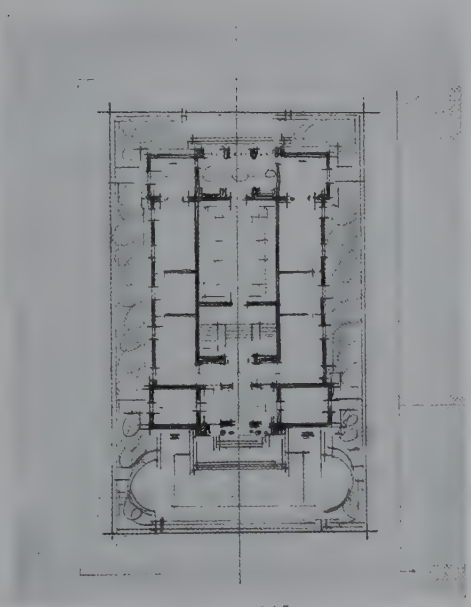


Figure 115.

Now let us take a program and make an esquisse, remembering that the process would vary somewhat with each program.

PROGRAM
CLASS "B" IV PROJET

The Committee on Architecture proposes as subject for this competition:

"A Small Memorial Art Library and Museum"

A patron of Art in a small city has left to the community a sufficient sum to build a memorial to house his library of books on art and architecture, and for the exhibition of his small but valuable collection of paintings, sculpture and examples of the minor arts. This building, while a memorial to the donor, is to be free to the public, especially to students.

The land on which this building is to be built is 120 x 180 feet with the short side facing an important street. Less important streets surround it on the other three sides.

The ground floor will contain:

A vestibule, with a curator's room and a room for the superintendent.

A staircase or staircases leading to the floor above.

The library suitably fitted with large reading tables and with shelves for the accommodation of large and bulky volumes. This room may extend through two floors and be lighted from the top. It should have an area of 2,000 square feet.

The galleries for the exhibition of sculpture and the minor arts. These galleries should be lighted from one side only and should have a total area of approximately 3,000 square feet.

The second floor will contain:

The galleries for the exposition of paintings, tapestries and other things of that nature. These galleries should have top light. Their area is not determined, but should be as great as is consistent with the design.

The treatment of the grounds about the building should be given consideration owing to the location of the property on the important street of the town. Required for the esquisse: plan, elevation, and section at the scale of 16 feet equal one inch. Required for Projet Rendu: plan and section at scale 16 feet equal one inch, elevation at scale 8 feet equal one inch.

Having read the program thoroughly, and noting the word "small" in the title, and the two words "Art Library" and "Museum", we would go over it again, underlining in the first paragraph the words *small* (city); *small but valuable collection; paintings, sculpture, minor arts; memorial to donor, free to public, students*—and in the second paragraph—*short side, important* (street) and, below, *library . . . may extend through two floors . . . lighted from top,* and *galleries . . . lighted from one side,* and *second floor . . . top light.*

Figure 116. "A Small Hôtel de Ville," by M. Favier. Atelier Laloux, Ecole des Beaux Arts, Paris.

As the size of the lot is given it is well to draw it to scale, perhaps half the scale required for the esquisse, and to lay out the other areas given by the program at the same scale, as shown in Figure 112. It is well to mark a graphic scale, as in this illustration, to keep well before us a comparison of sizes. The galleries are stated to have a total area of approximately 3,000 square feet. They are here laid out with a depth of 20 feet, as they are to be lighted from the side; we must keep in mind that if this depth is increased or diminished, the other dimension would be correspondingly affected. The library may vary in shape, provided that the area be kept approximately the same. These sizes are put down in a line in a sort of diagram.

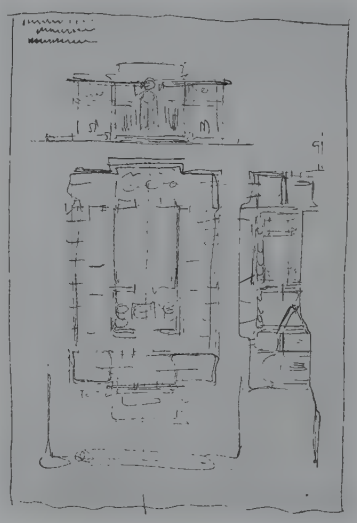


Figure 117.

We note that, with the exception of the rooms for the curator and superintendent, all rooms are open to the public and that the stair is a public stair. Of these rooms, the galleries, from their nature, may serve as "circulations," and corridors may be dispensed with; while the library, on the other hand, should not be used for passing from one place to another, as those using the books would be disturbed.

If the student can put down on this diagram the size of a room similar to one of the rooms in the program – if he should happen to know the size of a room in the J. P. Morgan Library in New York, for instance – it will be of great assistance in visualizing the scale of the rooms called for.

With this diagram before him, the student can make a beginning in trying different arrangements of the elements, at first making diagrammatic studies only to try out different arrangements as in Figure 113, and then trying out on tracing paper various schemes with the rooms drawn in their true shape, as in Figure 115, moving the tracing paper around over the diagram so that the elements may be traced where wanted. During this process any desired changes in proportion may be made.

As for the analytique, as many schemes of plan arrangement should be found as possible: among these the better should be chosen and studied further, now giving some thought to elevation and section. As these are drawn at small scale their several elements should be "indicated" rather than drawn, as in Figure 114.

At this point a decision must be made, one of the solutions must be chosen, and the rest of the time spent on perfecting the parti; the actual esquisse may be rapidly traced over the last studies, and should express the general characteristics of the chosen parti without an insistence on detail, Figure 117.

During the study of the problem the esquisse should be kept in view, and a serious attempt made to develop the scheme within the limits allowed by it. This does not mean that all thinking about the parti is stopped at this point, and the rest of the time spent merely in making a careful drawing of the accepted scheme. One has been committed to one scheme, it is true, but as the problem is developed in study, and as defects or difficulties appear, one's ingenuity must be used to the utmost in solving these difficulties. When a solution has been found for any point, it must then be studied *in relation to the indication of the* esquisse, so as to seem to be a reasonable expression of the lines in the esquisse, granting that these lines may be warped or stretched somewhat to make the final result plausible.

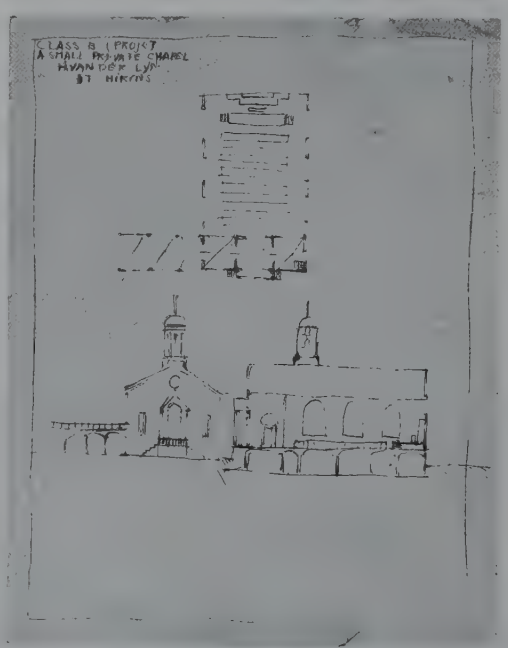
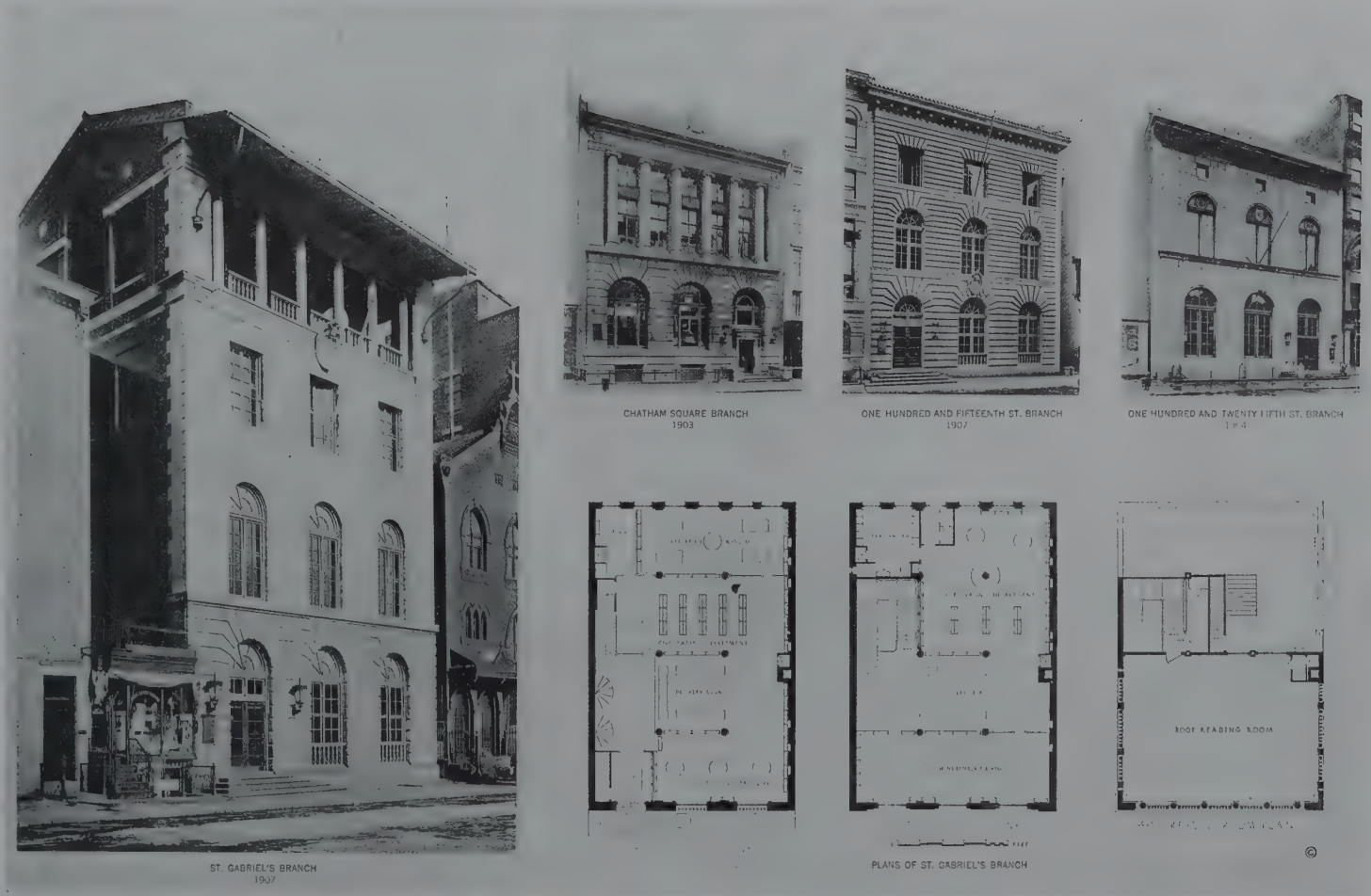


Figure 118.

In the development of a problem, the elements indicated in the esquisse (rooms or open spaces in plan, motives in elevation), *may be changed considerably in proportion, but no such elements may be left out, and none may be added.* What has been shown as a 'room' in plan in the esquisse may be developed as 'court' in the final drawing, or vice versa, unless the indication *in section* has committed the author to the one or the other. Stairways usually are rather definitely fixed in plan and section by the indication in an esquisse: for this reason they should have particularly careful thought during the making of the preliminary sketch. Figure 118 is an esquisse for "A Small Private Chapel on a Country Estate," the final drawing for which is shown in Figure 119.

Figure 119. Class B Projet, "A Small Private Chapel on a Country Estate." H. Van der Lyn, Atelier Hirons.



Courtesy of The Architectural Book Publishing Co.

Figure 120. New York Public Library Branch Buildings, McKim, Mead & White, Architects. From the "Monograph of the Work of McKim, Mead & White."

THE CLASS B PLAN PROBLEM

CHAPTER XI

THE USE OF EXAMPLES OF SIMILAR PROBLEMS

THE "parti" chosen, the esquisse made and turned in, we are ready to start the study of the problem. One of the first things to do is to look up solutions of a similar problem, executed if possible. If there are none near by, the next best course is to look up "documents" of such solutions, and make notes and sketches of what is found. These "documents" may be divided into two general classes: *a*, architectural magazines showing contemporary work; and *b*, the books showing works that are now accepted as good – historical examples. The latter division includes books of photographs, engravings, or drawings of executed work which, since America is young as compared with the old world, are drawn largely from European sources. To study well most problems both kinds of "documents" should be used.

However, the existing buildings should be tried first, especially to study the technical details that are peculiar to the class of building in which the program lies. For instance, if your problem is a small art museum (one such as was given in 1920, for which Figure 126 was a good solution as well as a charming piece of presentation) nothing will start you so well as to examine a small art museum; you may have been in it many times before, but if you go now, after having studied a program and made an esquisse for that kind of building, you will note many arrangements of plan and section that before had not been evident. If possible, talk to the curator; he will show you what is good and what is unsatisfactory in the arrangement of that particular art museum, and why, and what improvements later experience would suggest as desirable.

If the problem is a public library, the student working in a city will be able to visit one of the Carnegie libraries. And though the solution of this problem may vary from city to city, the variations are usually the result of perfectly evident conditions. For instance, in New York City, where the price of land is prohibitive, these buildings are generally built between party walls, and must extend through several stories, as in Figure 120, while in Philadelphia, where land has not risen to such value, the usual solution is a free-standing building of one story and basement, as shown in Figure 123. The program will usually establish such a difference and a building of either type, or any small library, will show how the different elements of the plan work together – to which rooms the public has free access, and how the control or supervision is arranged.

Figure 121.
Plan of a Restaurant in the Environs of a Large City
F. D. Atherton, Pupil of M. Gromort, Ecole des Beaux Arts.

Or the problem may be a small suburban railroad station, where a solution requires an arrangement of the means of access to and egress from the track platforms, the control of passengers and handling of baggage. Figure 127 illustrates a solution of a recent program on this subject. It is easy for any one to see a small railroad station; it may not be a good piece of architecture, but it probably solves satisfactorily the question of the handling of passengers and freight, and should be examined to discover how this is done. A few minutes' talk with the

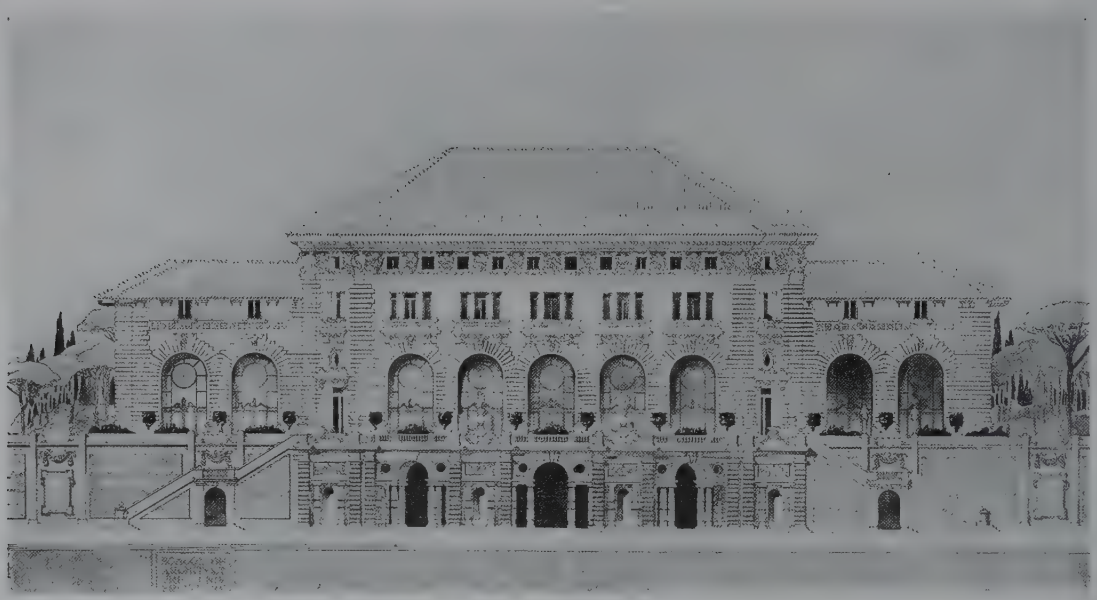


Figure 122. Elevation of a Restaurant in the Environs of a Large City, by Faxon D. Atherton, Pupil of M. Gromort, Ecole des Beaux Arts, Paris.

station master would be worth several hours of misdirected work over the drafting board. In this way one will learn how much headroom is needed over the tracks, what course the baggage follows after it is delivered by the van and until it is loaded on the baggage car; and where the ticket offices should be located so as to be accessible and yet not in the way of people hurrying to trains; how the stairs are arranged to and from platforms if the tracks are at a different level, and how much headroom is needed for these stairs.

To take another example, if the problem is a restaurant (Figures 121 and 122 show a solution for such a projet), there are, in addition to the rooms accessible to the public, such as the vestibule, dining-room, private dining-rooms, coat and retiring rooms, the problem of the "services" – the handling of the food; how it enters without coming in contact with the arriving patrons; how the storerooms for the food, locker rooms for waiters, cooks, dish-washers, etc., are arranged; how the kitchen should have, if possible, adequate outside light and cross ventilation; how the serving rooms are placed in relation to the dining rooms and to the kitchen. These are all matters upon which one *should* obtain information.

After having gleaned as much of such knowledge as is possible from actual examples, one can look through the architectural magazines to study plan arrangement to fit modern usage. Where the problem involves technical detail one can usually find in the architectural press authoritative articles on that particular problem, sometimes quite complete works like the series by C. H. Blackall, on the theatre, in the "Brickbuilder," in 1908, and the later series on the moving picture theatre in the same magazine by C. A. Whittemore. Almost every field of modern architecture has been covered in the magazines by authoritative articles. The student should read and make notes from such articles; usually there is present on the jury some one who has specialized in the class of architecture in which the problem occurs.

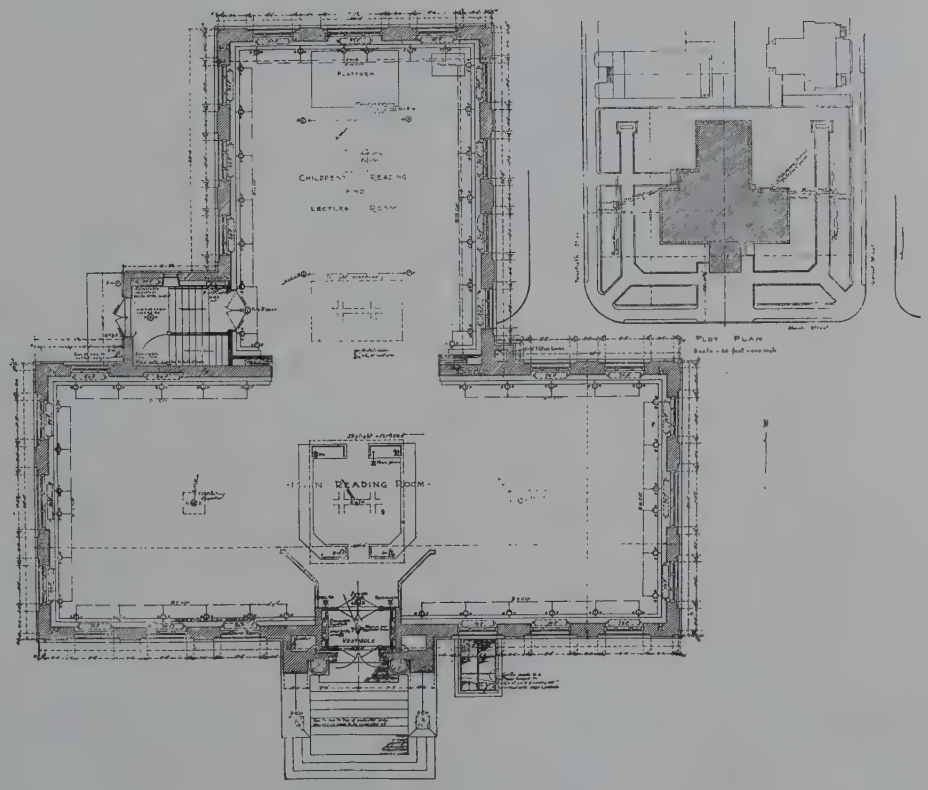
In studying any problem, look for solutions of similar programs; find wherein the program of these previous examples differs from the program being studied. That is the point to attack, the part of the problem that requires a new solution.

The study of design of façade, of proportion of window to wall, arrangement of openings, etc., should still be made largely from historic documents, and once the scheme has been well laid out it is well to study the old documents for the form of plans, for interesting arrangements of poché, etc.

In such books as Letarouilly's "Edifices de Rome Moderne," in "Architecture Toscane," and in "Palast Architectur," note, in addition to the wealth of architectural detail, and the profiles of mouldings, etc., the many small plans, of which Figure 125 is but one example, that give a variety of forms for rooms and open spaces. The elevations shown in Figure 120 all show the influence of old documents, and illustrate the adaptability of historic forms to plans designed to fit modern uses. Figure 124, from Letarouilly, shows how interesting the section of a small building may be made by the variety in treatment of the different rooms, and how the vaulted forms over some contrast with the flat ceilings over the others.

Durand's "Paralléle d'Architecture" is interesting as showing grouped together the buildings with similar programs. Gromort's "Choix de Plans de Grandes Compositions Exécutées" is valuable for the study of plan forms. Figure 128 from this book shows the great variety of poché that really exists in well designed buildings.

Front Elevation



Plan

Figure 123. The Free Library of Philadelphia, Passyunk Branch
John T. Windrin, Architect.

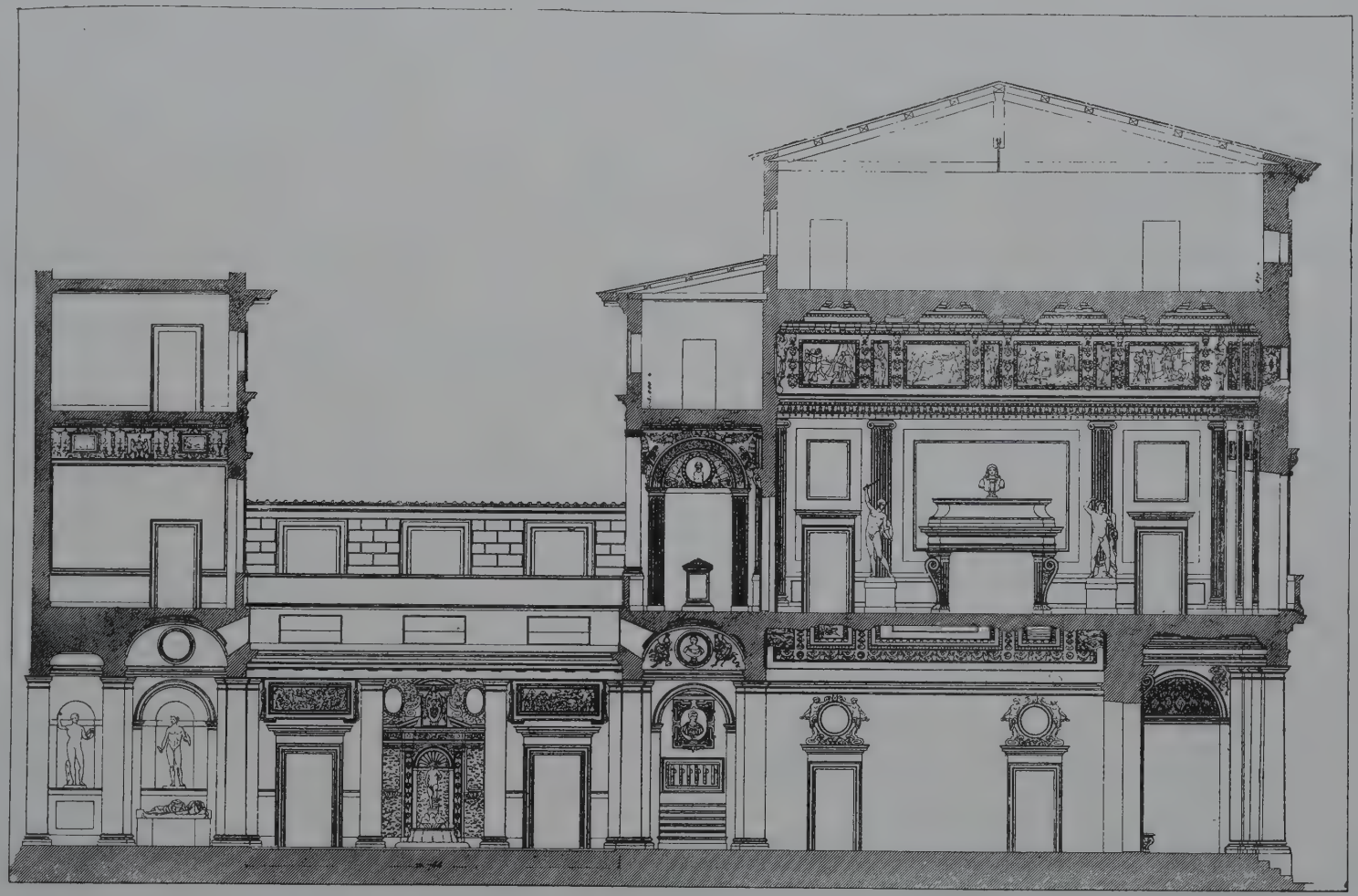


Figure 124. Section of Palace of Pietro Massimi, Rome. From Letarouilly's "Edifices de Rome Moderne."

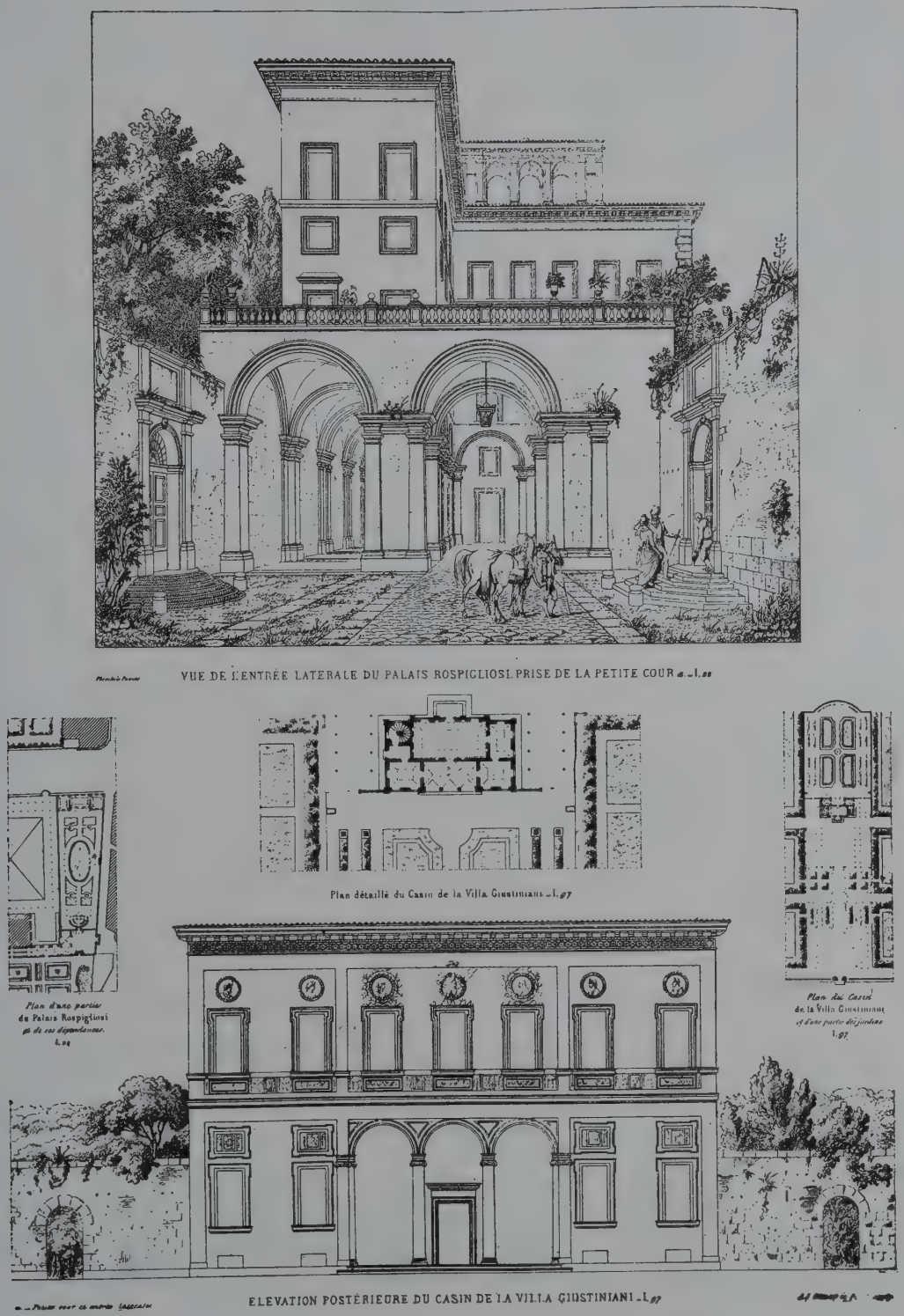

VUE DE L'ENTRÉE LATERALE DU PALAIS ROSPIGLIOSI PRISE DE LA PETITE COUR
Plan détaillé du Casin de la Villa Giustiniani
ELEVATION POSTÉRIEURE DU CASIN DE LA VILLA GIUSTINIANI

Figure 125. Rospigliosi Palace and the Casino of the Villa Giustiniani. From Letarouilly's "Edifices de Rome Moderne."

Figure 126. Class B Projet, "A Private Art Museum."
G. W. Trofast-Gillette, Columbia University.

Figure 127. Class B Projet, "A Small Railroad Station."
J. H. Geissel, T-Square Club, Philadelphia, Pa.

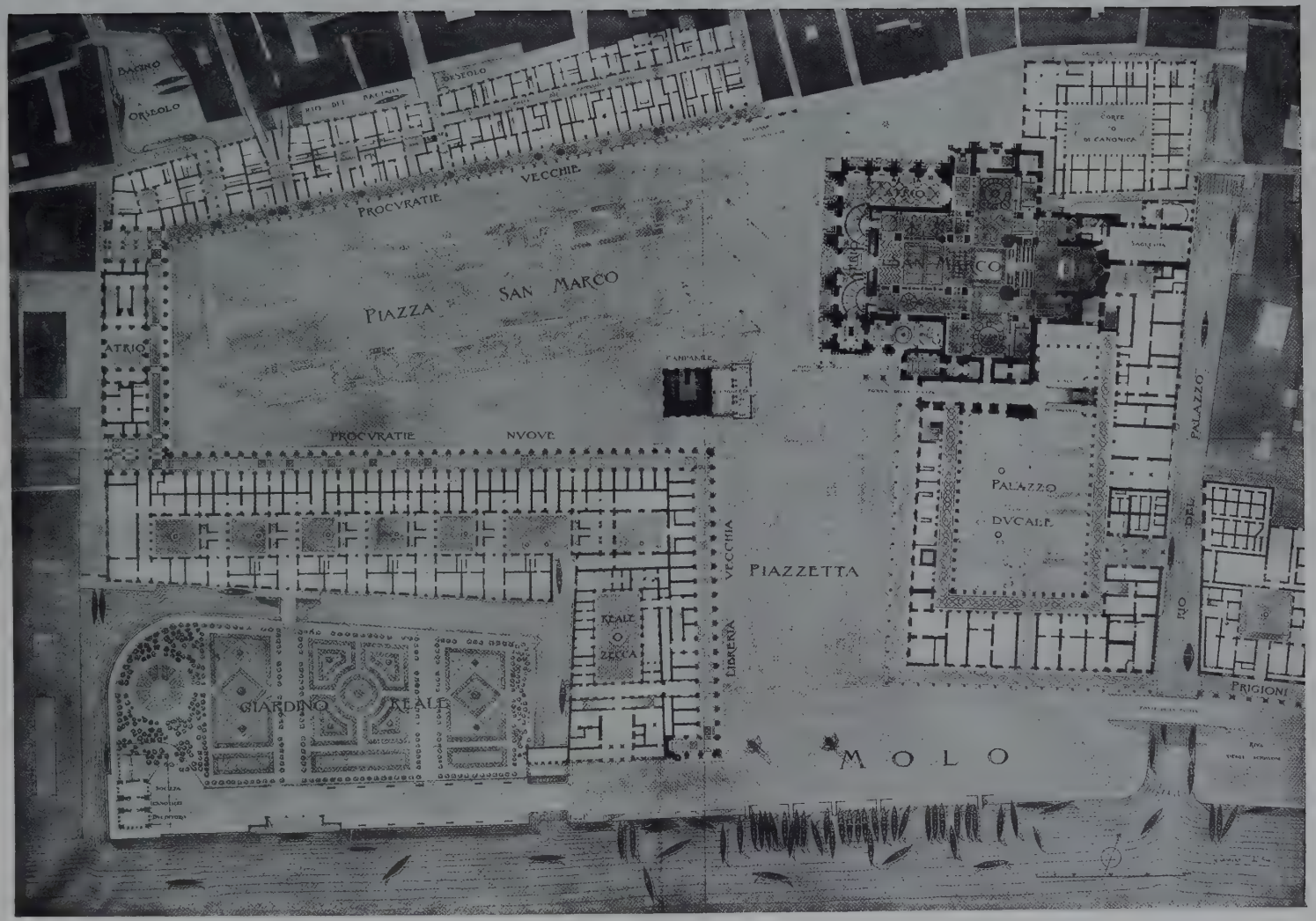


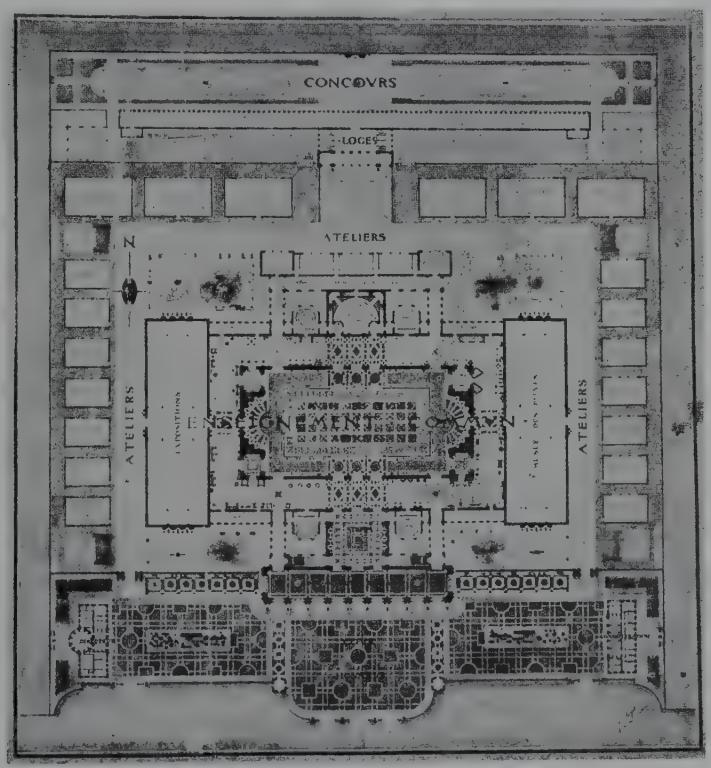
Figure 128. Buildings about the Piazza San Marco, Venice. From Gromort's "Choix de Plans de Grandes Compositions Exécutées."

Figure 129. Antique Capital. Restoration by Paul Bigot that is a masterly example of the modeling of form. From D'Espouy's "Fragments D'Architecture Antique."

The work done at the Ecole des Beaux Arts at Paris – the "Concours d'Ecole," the "Medailles," and the "Grand Prix" – are of course good documents for the composition of forms and for their indication, especially for the plan. They are excellent for the study of plan form and of "parti," in which case the program should be read at the same time that the plan and section are studied. It should not be forgotten in using them, however, that they, too, are school work, i.e., the work of men who, though clever, are not yet mature, and that the problems there illustrated are done in a limited time, of which time the greater portion is spent on studying and perfecting the "parti," so that they are not as good documents *for architectural forms* – for the study of the elevation and its details – as are the books of historic examples.

The student should now become familiar with Guadet, studying enough French to find his way through it—it is written in simple language—and he should read the chapter bearing on the problem in hand. If a student were limited to one book, this is the one, in my opinion, that would be of most service to him.

Your "Patron" will criticize your work and correct the proportions of your studies; it is for you to *try out different ideas for your plans, sections, and elevations,* to put before him for his criticism. The elevations in Figure 120 illustrate the variety that is possible in one elevation for the same plan; each of these is good, no one of them could be picked out as being "the" elevation. It is well to realize that there is no one arrangement of forms, especially in a façade, and generally in a plan, that is the "best" arrangement; but that there are many that may be good if well handled.



Plan of a School of Fine Arts, by P. Bigot. This is an example of "school work" done at the Ecole des Beaux Arts in Paris, and published in the "Concours d'Ecole". Note the difference in indication of poché, as well as of "mosaic", between the front part of the plan, used for the public mainly for exhibitions, and the workshops at the rear.

Figure 130. Fontaine Medicis, the Luxembourg, Paris. From J. Guadet's "Eléments et Théorie de l'Architecture". Stone carving in the form of stalactites to harmonize with the cascade and emphasize the water idea of the program.

THE CLASS B PLAN PROBLEM

Chapter XII

CHARACTER IN DESIGN

BUILDINGS serve many different purposes, are built with many different materials, and by men of different minds. But, nevertheless, structures of a class have come to have some things in common with other buildings of that class, so much so that we now feel the need of definite "character" in all buildings. A church should create an atmosphere of reverence: a domestic building – intimacy: a fortress – strength:– and this, aside from the actual fulfillment of all of the conditions stipulated in the program.

It will be seen that the word "character" means many things: there is the question of style, or period. It is possible to get the character of a "period." It is also possible, within such a style, to get the character of the uses of the building. We all have seen in the recent popular revival of the "Adam" style in New York, city houses, apartment buildings, hotels, banks, office buildings and churches — all undeniably Adam in inspiration, and yet the good examples are likewise undeniably religious, commercial, domestic, etc., as the case may be.

Then, there is the question of the size and scale of the building being designed, of the materials of which it is made, and, most important of all, of the uses to which it is to be put—commemorative or utilitarian, domestic or public, religious or secular, etc.,– and then in each of the big classes are subdivisions; i. e., if domestic, whether city, suburban, or country house, whether small or large. Each type of religion has in its growth assumed special attributes which give character to its architecture. A synagogue is of a type different from a Christian church; Christian Science, though young as a religion, has already a well defined type of architecture. A commercial building will be treated very differently if it is a bank, or a factory, a storage house, or a loft building.

Figure 131. Colonne du Châtelet, Paris.
From J. Guadet's "Eléments et Théorie de l'Architecture."

This "character" of building may be the result partly of the use of detail, surface indication— the use of the musical instrument in the decorative motives in a concert hall, of the mask in a theatre, of angels in a church, the victory with the laurel wreaths in a structure commemorating military success, such as Figure 131, etc. Or it may result mainly from conditions of program — the large amount of wall surface taken for windows in schools and factories, where light is so necessary; or the blank walls of storage buildings, such as Figure 135, a design for "A Repository for the Archives of the Ministry of War," where a window is a disadvantage as it lessens the strength of the building, or is at least an unwarranted expense. Or it may result simply from "tradition" — from what has been done

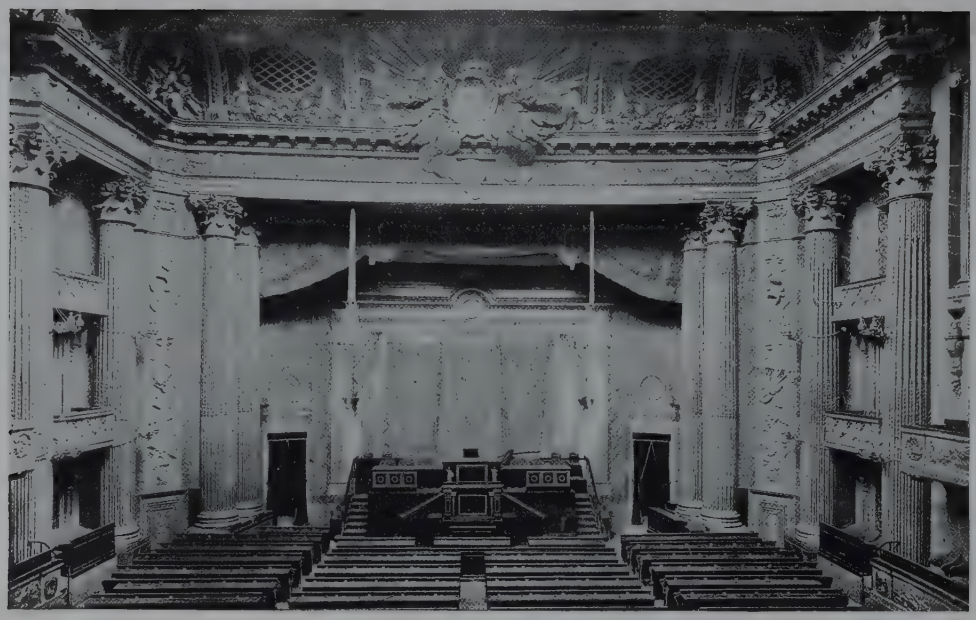


Figure 132. Theatre Looking Towards the Stage, Palace of Versailles.

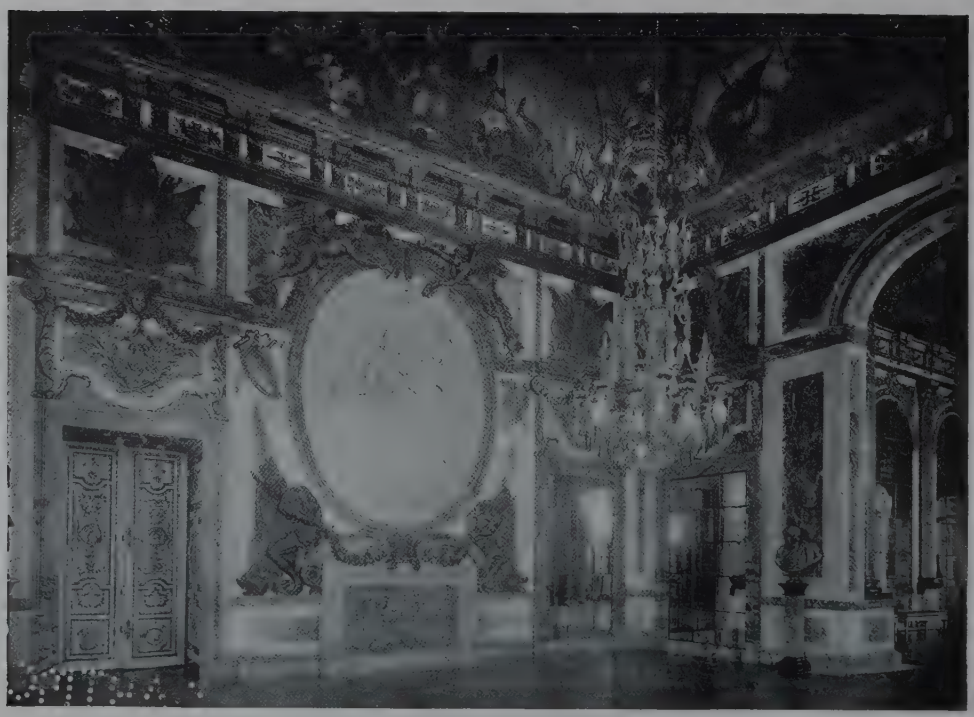


Figure 133. General View, Salon de la Guerre, Palace of Versailles.

Figure 134. Pavillon Sully, General View of the Façade on the Court of the Louvre. Built by Jacques Le Mercier in the Reign of Louis XIII. An extreme example of a structure designed to reflect the influence and power of the one for whom it was built. From "L'Architecture et la Décoration aux Palais du Louvre et des Tuileries."

before in similar cases.

If a church had become known far and wide as a lovely work, or even if because of some reason not connected with architecture itself—if large numbers of people had come on pilgrimages to see the performing of miracles of healing, or to hear one whose fame as a preacher had spread far and wide, common occurrences in the middle ages—countless people took home with them memories of chapels which had a new interest. And copies, or what in those prephotographic days people believed were copies, were built throughout the country.

In fact it was the custom in those days, when a church was to be built, to send the master-builder on tour with instructions to look at—to make note and take measurements of—a chapel here, an ambulatory there, a crypt in this town, a chapter house in that, which had impressed the bishop or other dignitary responsible for the work. Such a pilgrimage has been preserved to us in the book of Villard de Honnecourt, who made such notes for a French cathedral, travelling as far as Hungary. Figure 136 is one of the notes he so made. In this way the "tradition" of church architecture spread.

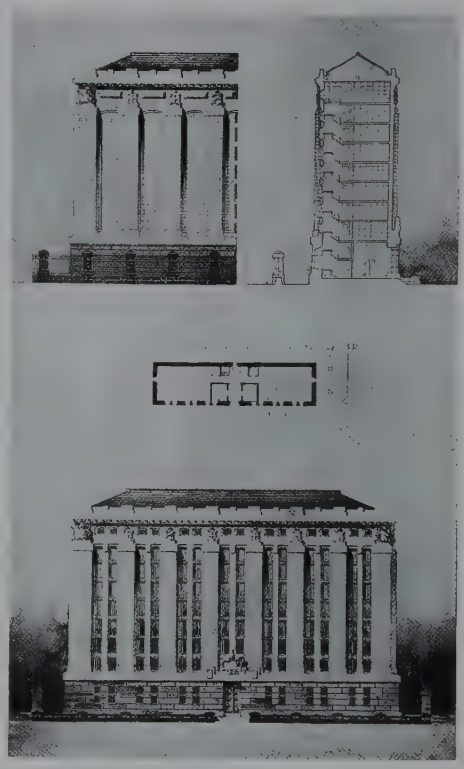


Figure 135. A Repository for the Archives of the Ministry of War. From "Les Concours d'Architecture," Ecole des Beaux Arts, Paris. Design by M. Holabird, Pupil of M. Redon.

The character of all classes of buildings has been moulded in similar fashion. Even when the Renaissance changed the forms of architectural thought – changed the forms of construction – back from complicated systems of counter-balanced thrusts, the stone vaults high in air, resting on thin points of support, to the simpler system of post and lintel and the more elementary vault forms, there were still many minor elements of architectural design that carried over from one to the other in each type of building.

For instance, we find that armories and prisons are treated as if they were fortresses, made to withstand an attack from without, while banks—which need as much to guard their contents from outside assault, and do aim to have an appearance of strength and solidity — endeavor to disguise this characteristic somewhat in order to be inviting enough to draw in customers.

To make use of this strong element of tradition in architectural design, we study examples of previous work. One of the best aids to such a study is the reading of the chapter in Guadet's "Eléments et Théorie de l'Architecture" appropriate to each program. Study so inspired will cultivate the imagination and form the habit of allowing one impression to suggest another; and if one can at the same time stimulate the memory to retain these impressions it is possible to develop a working "vocabulary" of architectural forms and decorative motives.

Building ranges between two extremes — the useful, and the ideal; usually it partakes of each of these in some proportion. Figure 131 is an exemplification of the "ideal"—it is a commemorative monument without any touch of the funereal. Here the column is surmounted by a victory, is banded with the names of victorious campaigns and in addition to the laurel wreath of achievement, we find the eagle of empire, the horns of plenty; and the sphinxes at the base, recalling the Egyptian campaign, give a softening effect both to the lines of the composition – easing the vertical lines of the column into the horizontal of the ground – and to the general effect of the idea

Figure 136. Drawing by Villard de Honnecourt. From Reginald Blomfield's "Architectural Drawing and Draughtsmen." Published by Cassell & Company, Ltd., London.

by the jets and pools of water. In the Medecis Fountain at Paris, Figure 130, the stone is cut in the form of stalactites to harmonize with the cascade below and emphasize the water idea of the program.

Aside from the uses of the structure, certain ideas should be typified in it. If it is to be monumental, that feeling – the idea of something superhuman – may be obtained by an excess of mass, or by heavy supports, while if domestic the masses are small and rather informal.

The influence and power of the one for whom a structure is built are frequently reflected in architecture. As an extreme, in the "Pavillon Sully," of the Louvre, Figure 134, built by a king with enormous wealth at his disposal, note the richness of the architecture. It is made of real stone, the work done by master craftsmen; almost every moulding is carved, each one with different motives – shells, leaves, garlands, cupids. In the pediments, over the windows, in the niches, is exquisite sculpture. Even the roofs are ornamented with richly designed and wrought leadwork. In this country architecture such as this would be out of place, as we have no element in society that can afford to give the impression of being as wealthy as a king, except in interiors, where such richness would not be apparent to the public.

In the palace at Versailles, (See Figures 132 and 133, from "L'Architecture et la Décoration aux Palais de Versailles et des Trianons") there is the same richness and profusion of ornament and material, especially in the "Salon de la Guerre," real marble, real bronze, paintings by good masters, stucco work by clever sculptors, chandeliers ornate with crystals, but well designed and well executed.

Where such an effect of richness is attempted without the use of the genuine materials, or without the skill of well-trained craftsmen, as in many of our theatres and moving-picture houses, the result is very unsatisfactory to anyone who knows the originals.

There is also the question of the difference in character between an exterior and an interior—the latter with its smaller scale motives, because they must be seen at closer range, and absence of such forms as pediments and drip moulds, etc., which are the result of exterior conditions. It is needless to say in this connection that in design almost every rule has been broken by a master at some time; that, for instance, pediments are used as interior decoration, but in such cases the form is changed in character to partake of the spirit of the interior, becomes in fact a "decorative" motive only.

Allied to this is the question of the effect of materials on character. Wood is capable of being worked at much finer scale than stone, for instance, and limestone and marbles may suitably be carved in finer scale than granite.

A stone column, with a bronze cap and base, would have those members at a much finer scale than the shaft—finer mouldings, thinner edges, more delicate ornament, etc.

There would be a difference in character between a wrought metal grille and one of cast metal, and a difference between one of iron and one of bronze. Each material imposes conditions which are inherent in its make-up and make for the beauty of that material. It is possible to make bronze grilles that look like wrought-iron, wood mouldings that look like stone, etc., but that does not make for beauty in design.

It is possible to show character of design in plan, in the design of the elements of the plan, and of the points of poché, as well as in the indication of "mosaic," of furniture, or ceiling and floor patterns. Of this we shall speak in the next chapter.

Keystone of the arcade of the Cour Visconti, Nouveau Louvre – Style Henri IV. A good example of stone carving and the treatment of rustication.

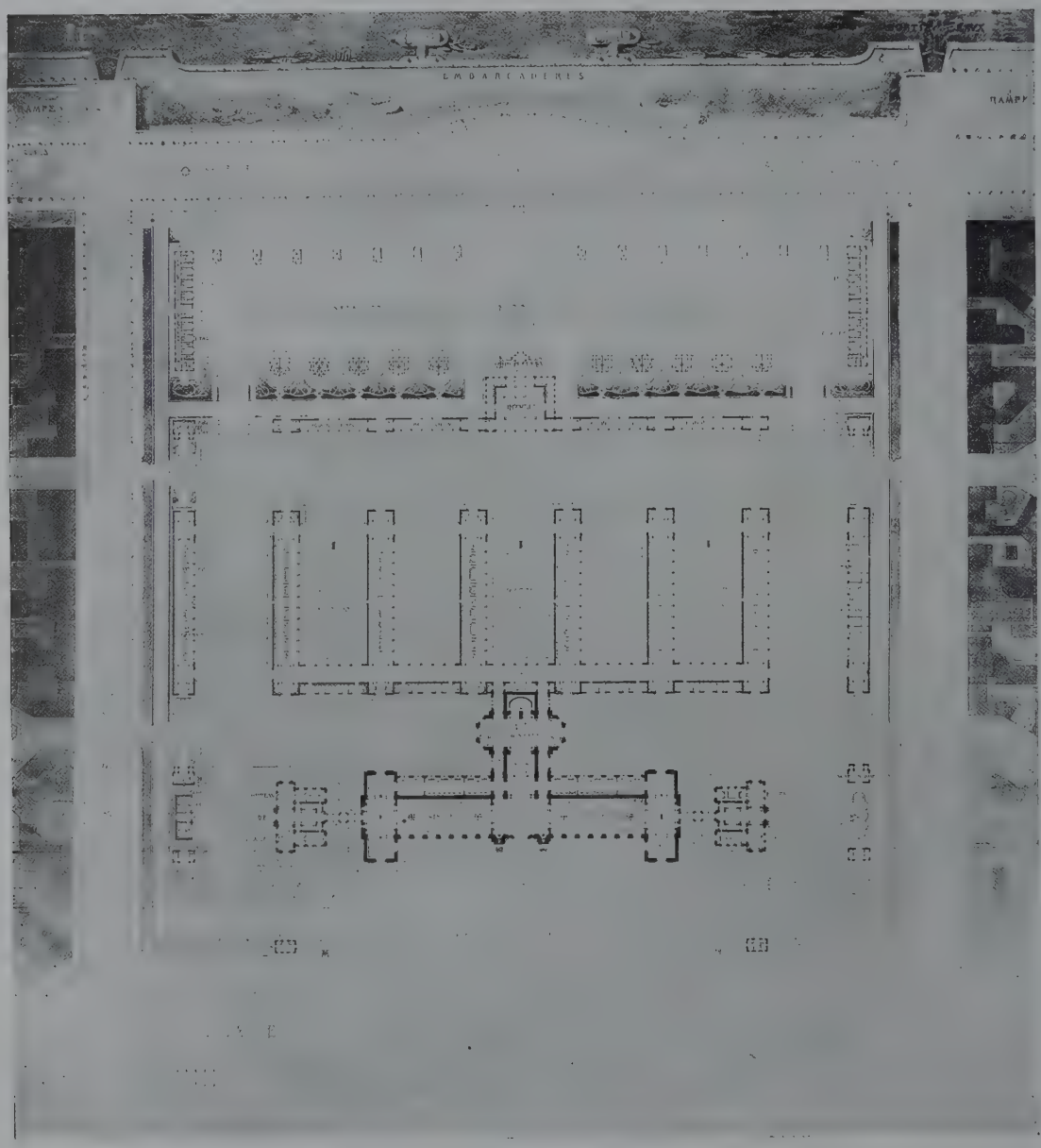


Figure 137. A National Manufactory for Tapestries. Design by Ernest Hébrard, Pupil of M. M. Ginain and Scellier de Gisors. Grand Prix de Rome, Ecole des Beaux Arts, Paris.

THE CLASS B PLAN PROBLEM

Chapter XIII

CHARACTER IN DESIGN—PLAN

IT IS easy to understand the meaning of the word "character" as applied to a façade or an interior. The writings of Ruskin have had a wide influence on education in this country, and enlarged the public appreciation of architecture, and, though in his later years he stated that much that he taught was overdrawn, he has undoubtedly taught the meaning of character in a façade. Character in plan is perhaps not as clearly understood, a plan being a conventional drawing. But if we take two examples of plans and study them, and compare them with each other, we shall see that it is quite possible to have a great deal of character in plan. We shall take two *Grand Prix* plans because they are so large they show many principles, and also because they are usually very carefully studied and great variety in the indication of plan forms results from this study.

Figure 138. "A Public Square," Grand Prix de Rome, Design by Jaussely, Pupil of MM. Daumet and Esquié.

Hébrard's plan for "A National Manufactory for Tapestries" (Figure 137) shows, at first glance, three distinct parts, each evidently intended for a different purpose which is indicated by the character of the three particular portions of the drawing. At the front is a forecourt with a garden inviting the public in to the museum and the reception room of monumental architecture; on one side of this is the administration office, and on the other side the director's house. The same formal and monumental treatment is carried out in these buildings but their smaller rooms show clearly that they are not for the use of the public. In the center is an enclosure with buildings obviously intended for workers only—plain structures with simple walls and good light, the windows on one side only, presumably north, and with a business-like arrangement of the interior. Here are no gardens and the space between the buildings is simple and business-like. In the rear are little cottages and gardens with an air of intimacy—habitations evidently.

Figure 138 is the *Grand Prix* plan of Jaussely—a large public square, what we would call in this country a "civic center." Here the program, instead of calling for buildings arranged within a given space, asks for buildings surrounding a space. It is at once seen that these buildings are public buildings, monumental in character, and of great size contrasted with the private buildings behind them. Of these public buildings, the one at the back has a large room in the center, surrounded by small offices, in the middle at the back a "board-room," and across the front a tremendous foyer or vestibule, all of a simple character though monumental. This is the typical European plan of stock exchange building. The other large buildings, while quite as monumental, are much more frivolous in character—evidently receptions of various sorts take place there, especially in the one at the left, where there is a grand stair immediately behind the vestibule,—this stair leading to a suite of what are obviously reception rooms. On reading the program we find this building to be a "military center." From the list of requirements we should say it is very much what a building might be if it were built in Washington for the headquarters of the American Legion, should that organization hold ceremonies such as are held by the Legion of Honor in France.

Figure 139. Concours Labarre—Une Station Estivale. Design by M. Albert Le Monnier, Pupil of M. Héraud.

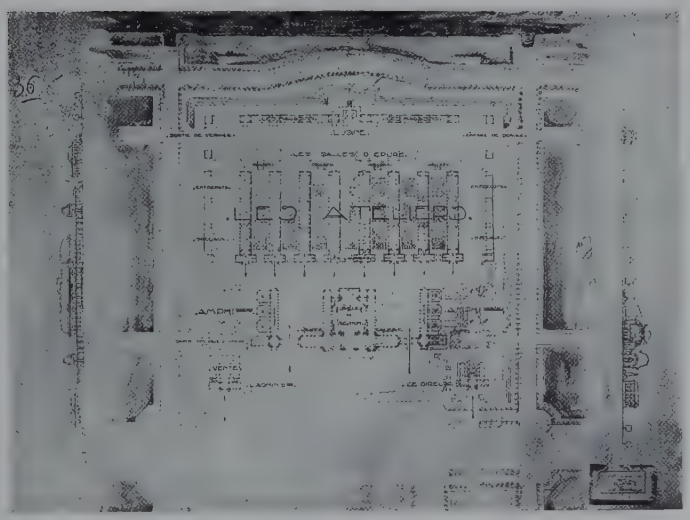


Figure 140. "Une Ecole Professionnelle d'Apprentis." Design by M. Japy, Pupil of M. Pascal.

The building at the right has, at the rear, a large exhibition room and in the center a theatre with a complete stage. This building we find is an "artistic center." Note the differences in character between the open spaces behind these two buildings, which emphasize the characteristics of the buildings. Behind the art building is a garden with outdoor exhibitions of sculpture or archæological objects, and back of the military building a parade ground, simply treated, with seats for spectators.

Now what is it that gives character in a plan? It is partly the actual drawing—the indication of "mosaics"—the showing of machinery in work-rooms, of desks and chairs in offices, of seats in a theatre, the flies of a stage, of decorated ceilings in reception rooms. This mosaic in the plans shown here has taken considerable time for the actual drawing—aside from any question of a study of character. But to see that character can be given without a great expenditure

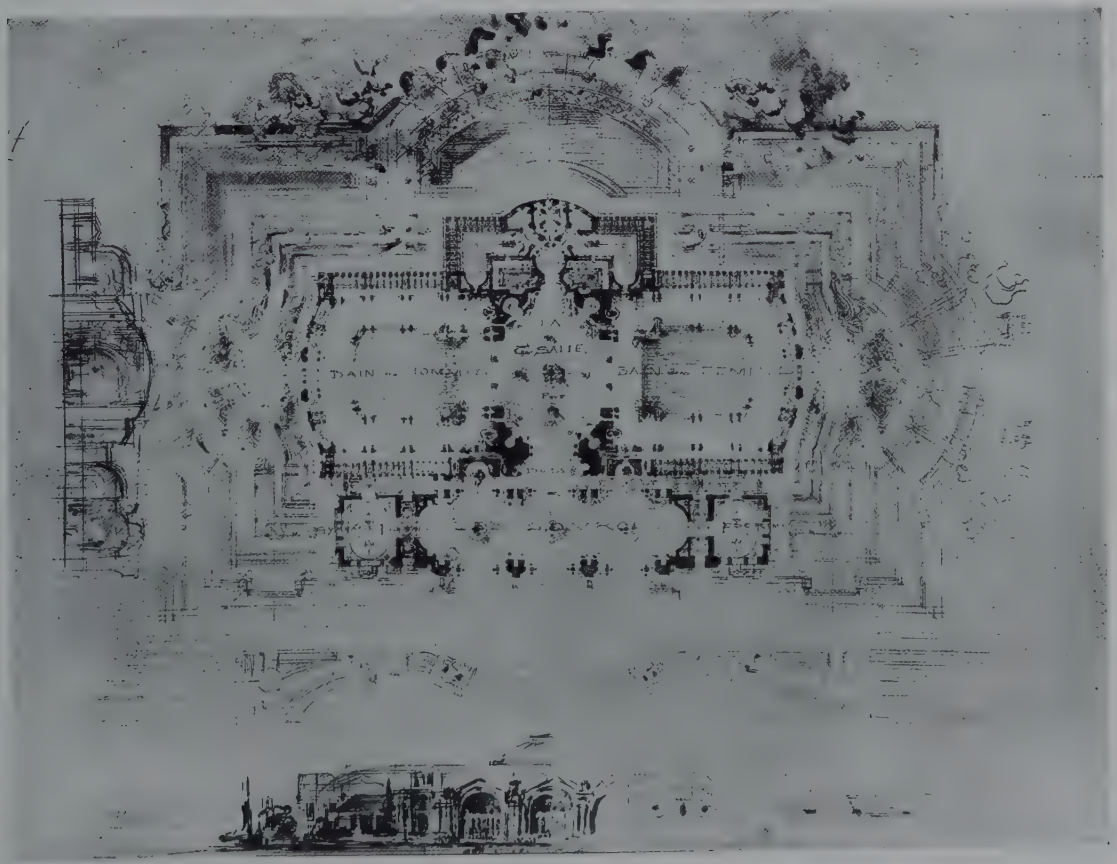


Figure 141. Establishment at a Mineral Spring. Design by M. Delaon, Pupil of M. Laloux.

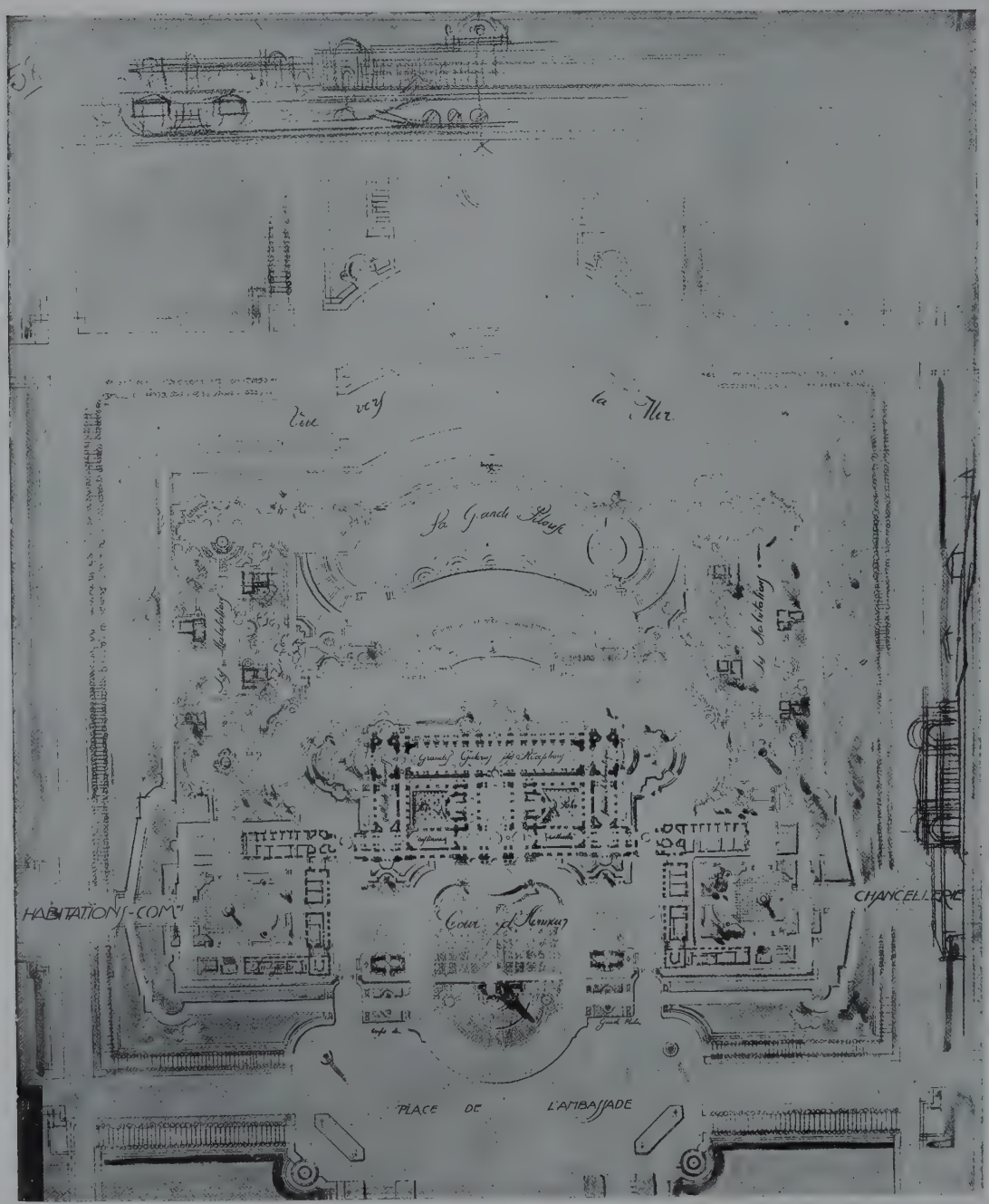


Figure 142. "A French Embassy in the Far East."
Design by M. Expert, Pupil of MM. Redon and Umbdenstock. (Twenty-four hour Esquisse.)

of time we need only look at Figures 140 and 142, both of which are sketch problems done at the Ecole in twenty-four hours, of which time probably a third was used in formulating the scheme and developing it. Figure 142 is a French embassy in an eastern country; Figure 140, a school for professional apprentices in a large city. Though these plans were made in a hurry, note how that for the professional school shows very clearly the difference between the buildings in front, open to the public, the workshops or ateliers in the middle, and at the back the power-house with its chimney, and warehouses; while the plan of the embassy gives at once the idea of hospitality, of receptions to dignified persons.

We see that character is given also by the nature of the "poché": the *indication of the walls and supports.* Thus in that part of the plan in Figure 137 open to the public, and the buildings of Figure 138, all of which are for the use of the public, we note the "richness" of poché of monumental buildings, the use of columns, niches, etc., and indications of sculpture. It is this study of poché that makes, in great measure, the difference in expression between the stock exchange and the other buildings in Figure 138, the former having simpler walls, monumental but businesslike, the others quite ornate, abounding—in all exterior walls and in the interiors of important rooms—in niches, small columns, etc. So also in Figure 142, the long gallery of doubled columns across the back of the building gives character to the reception or ball-room just within.

But though the idea of character is heightened, emphasized, by the "indication of poché," by the nature of mosaics, there is character in the plan itself before these furnishings are put in. The principal element in giving this character is the arrangement of the big elements of plan—the size, shape and treatment of the several rooms, of the courts or open spaces – the dignity or severity of treatment in some cases, the spirit of lightness and gayety in others, and so on. Thus, rooms to be used as exhibition galleries must have certain shapes and cannot vary greatly from certain sizes; rooms used as audience halls, auditoriums, theatres, will not vary greatly in shape unless of unusual size. Rooms such as the latter may very properly be placed in the center of a plan, natural light not being needed, while studios, work-shops, classrooms, etc., must have good light, and should be placed where they can get it—a court yard exposure would not be satisfactory unless the court were quite wide.

Tradition also plays its part here. Some rooms are made of the shapes we have become accustomed to see them take; thus in Figure 141, a building for the drinking of and bathing in mineral waters, the shapes in the plan recall the baths of the Roman Empire, to which is added the indication of the more modern dressing room of small size. In the same way the rooms for large receptions and balls are long in proportion to their width, as shown in Figures 138 and 142, because when rooms were first made for such a purpose, the known methods of construction limited the width, and the only way to make a larger room was by extending it at the ends, the use of vaults being undesirable as the resulting high ceilings would destroy the intimate feeling desired. We now do not consider a room for this purpose beautiful if of different shape, the tradition having been so strongly formed.

Again, the difference between buildings where masses of people congregate, such as a railroad station, city hall, or court-house, and a private house, even though a mansion in size, is shown in the character of the "circulations": in the former these are straight and easy, broad and conspicuous, while in the latter, though they may be ample in size, they will not show such directness, but are in every way more *intimate.* Such differences would show in plans even without any "mosaic" whatever.

The characteristics of site are usually shown by the treatment of the roads, and by the placing of the buildings. Thus in Figure 139, the mountainous nature of the ground is indicated both by the curves by which the large road reaches the open space before the main building, by the ramps shown elsewhere reaching from one level to another, and also by the fact that the different buildings, as well as the several terraces, are in lines parallel to one another (and these lines would approximate the "contour-lines" if we had a survey), which is the logical manner of building on the side of a mountain, where anything other than a narrow shelf as a building site could not be found except by grading at a prohibitive cost.

The examples used to illustrate character in plan have been of large groups of buildings; the same principles apply as well to the plans of the size of the usual Class B problem. Thus Figure 127 may be contrasted with Figures 106, 108 and 109, and we see the differences, both in plan and elevation, between a suburban building and one in the city, and by comparing Figure 126 with Figures 108 and 109, we see a difference in treatment between a "Private Art Museum" (the former) and one of the same size used by the public (the latter two).

The difference of the *Grand Prix* plan and the plan of the Class B problem is largely one of scale —many Class B problems could be found within one of the large plans—and these large compositions may frequently be used in studying a small problem, if one will keep clearly in mind the scale of each.

The best guide in this matter of character is the book of Guadet, so often mentioned, "Eléments et Théorie de l'Architecture."

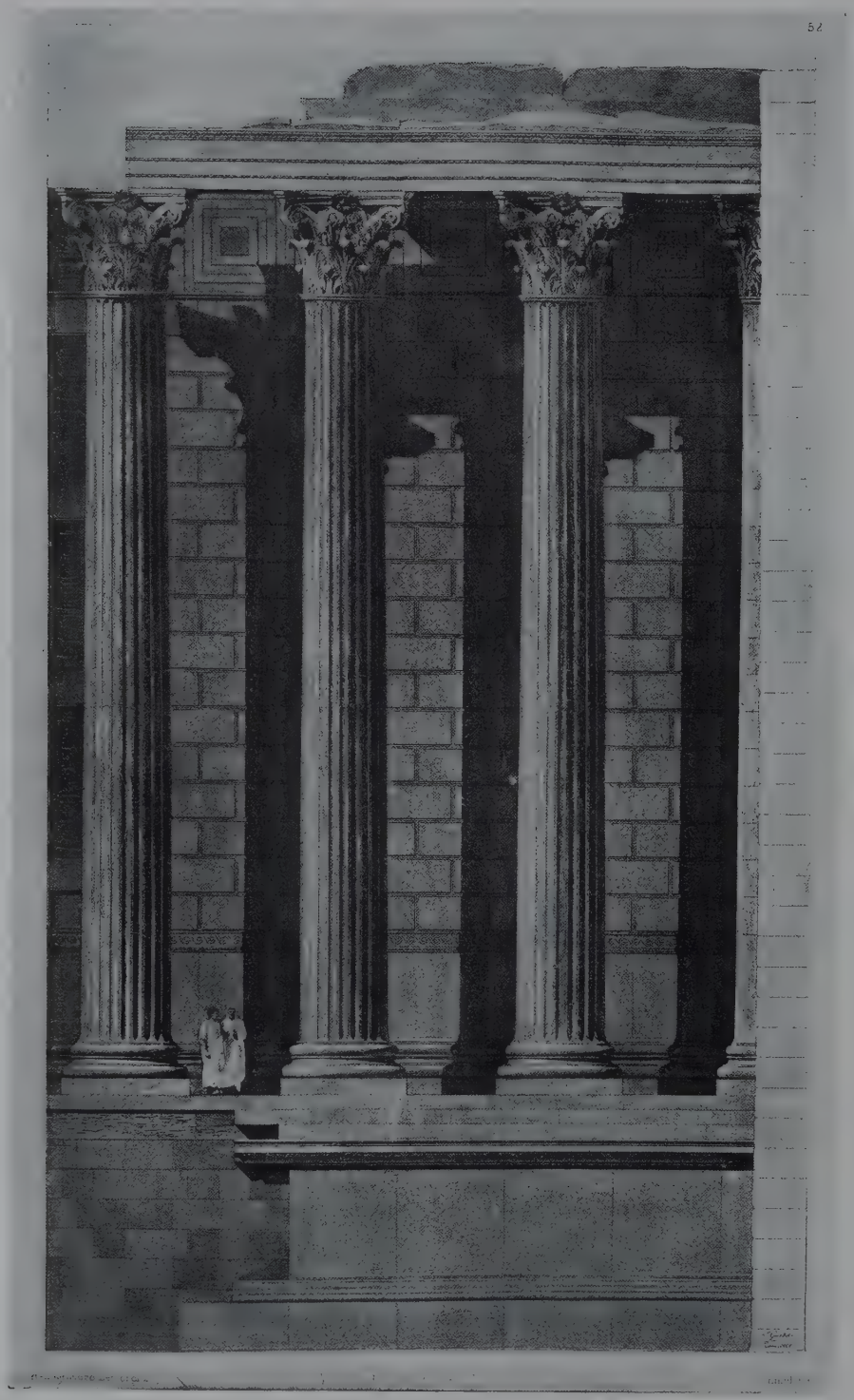


Figure 143. Detail of the Temple of Mars the Avenger, Rome. From D'Espouy's "Fragments D'Architecture Antique." The space between columns is roughly one and two-fifths the diameter of the column at the base.

THE CLASS B PLAN PROBLEM

Chapter XIV

SIZE, SCALE AND PROPORTION

IN AN earlier chapter I have spoken of the value of knowing the size of various good examples of architecture, and of architectural elements, in order to know how many motives can be put into a given length of façade, and how this number of motives would be affected by changing from the lintel to the arch type. In studying this question of size, and scale, we find that it is constantly becoming also a question of proportion—that an element of architecture may vary in size to a considerable extent if its treatment is changed. It is well to remember that, in the words of Guadet, "Proportions are essentially variable . . . two considerations should govern proportion—the program, the actual requirements, and the monumental effect . . . one cause of variety is the mode of construction."

A single motive of composition will give absolutely different expressions according to the proportions the designer has given it. Compare the two examples in Figure 145, the superposed arcades of the theatre of Marcellus at Rome (of which a rendered detail was shown in Figure 40), and of the court of the Farnese Palace at Rome; one was built under the Roman Empire, the other in the Italian Renaissance. The composition is identical; both are masterpieces; they are the same in actual dimensions, the intercolumniation in each being 16 feet, 3 inches. Each has on the first stage an arcade accompanied by two engaged Doric columns, an entablature, and then on the second stage, an arcade between two engaged Ionic columns and an entablature. And yet these examples are as different as possible; this difference is not in the ornamentation, nor in the profiles, it is in the proportions. If we compare the arches only, we find the following contrast of height to width: of arch A, the height is 2-2/5 times the width; of arch B, 2 times; of arch C, not quite 2 times, of arch D, 1-3/5 times.

There are many reasons which cause proportions to vary; one of these is the actual size. The spacing of columns depended on the length of the stone that could be obtained for the lintels, to span the space between the columns. The architects in antique times could build their columns higher very easily. They could not, however, obtain longer lintel stones, except occasionally. Consequently, they obtained a feeling of grandeur, of scale, by height only,—in other words, the more monumental the colonnade, the smaller, proportionally, is the intercolumniation. Thus in the temple of Mars the Avenger at Rome, Figure 143, the space between the columns is, roughly, 1-2/5 the diameter of the column, which necessitates a lintel 13 feet in length, which is very large. The column in this case is a big one, 56 feet 10 inches high, and with a diameter of 5 feet 9 inches. If the same proportions were applied to a column 20 inches in diameter—and there are many such—the space between columns, if the same proportions were followed, would be 27 inches—too narrow to walk through.

In the same way the Parthenon, Figure 146, with columns 37 feet high and 6 feet 2 inches in diameter, has a passage between columns, approximately 8 feet 5 inches, necessitating a lintel from center to center of columns of 13 feet 10 inches. If the same proportions were applied to the small temple at Cori—there are some even smaller—it would give as space between the columns, 3 feet, whereas the actual distance in this temple is 5 feet 5 inches. To take one other example, in the Portico of Octavius at Rome, Figure 147, a classic example of the placing side by side of a small order and

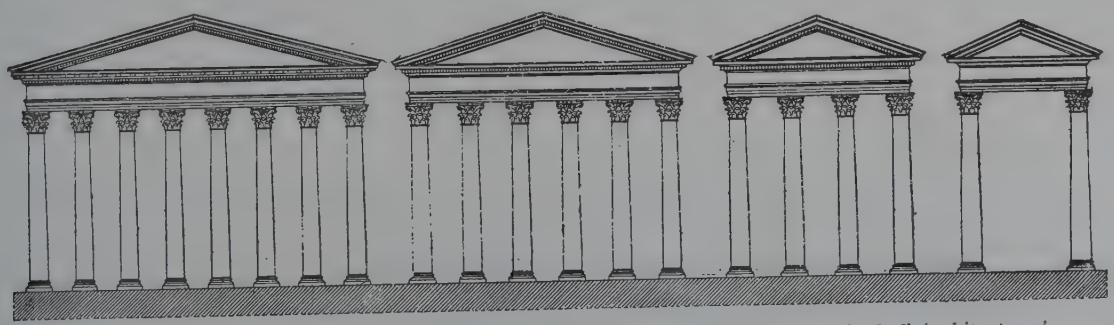


Figure 144. The Spacing of Columns. From Guadet's "Eléments et Théorie de l'Architecture."

Figure 145. At the left, one bay of the Theatre of Marcellus, Rome; at the right, one bay of the Court of the Farnese Palace, Rome. From Guadet's "Eléments et Théorie de l'Architecture."

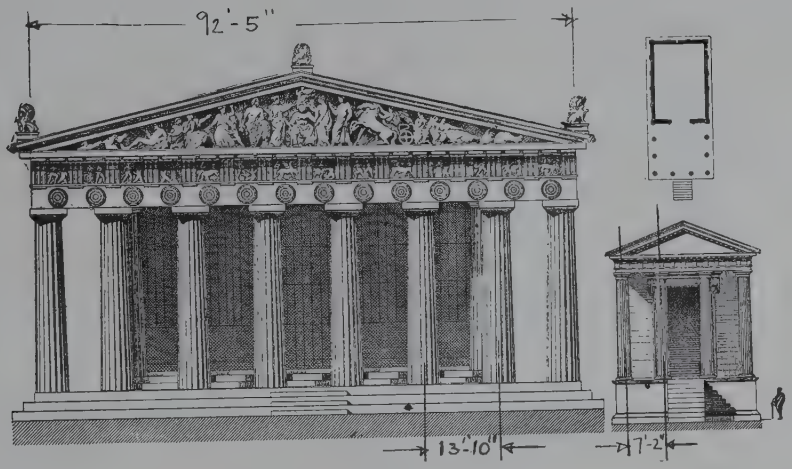


Figure 146. At the left, the Parthenon; on the right, the Temple of Cori. From Guadet's "Eléments et Théorie de l'Architecture."

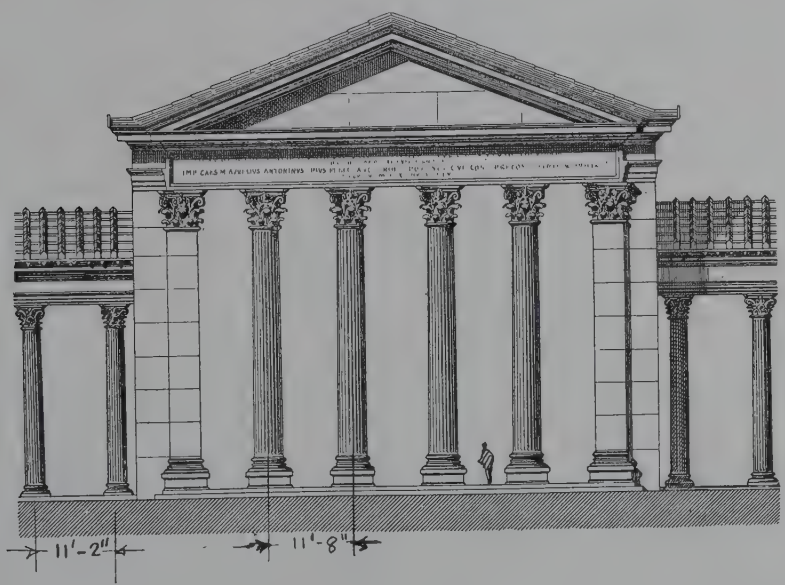


Figure 147. The Portico of Octavius, Rome. From Guadet's "Eléments et Théorie de l'Architecture."

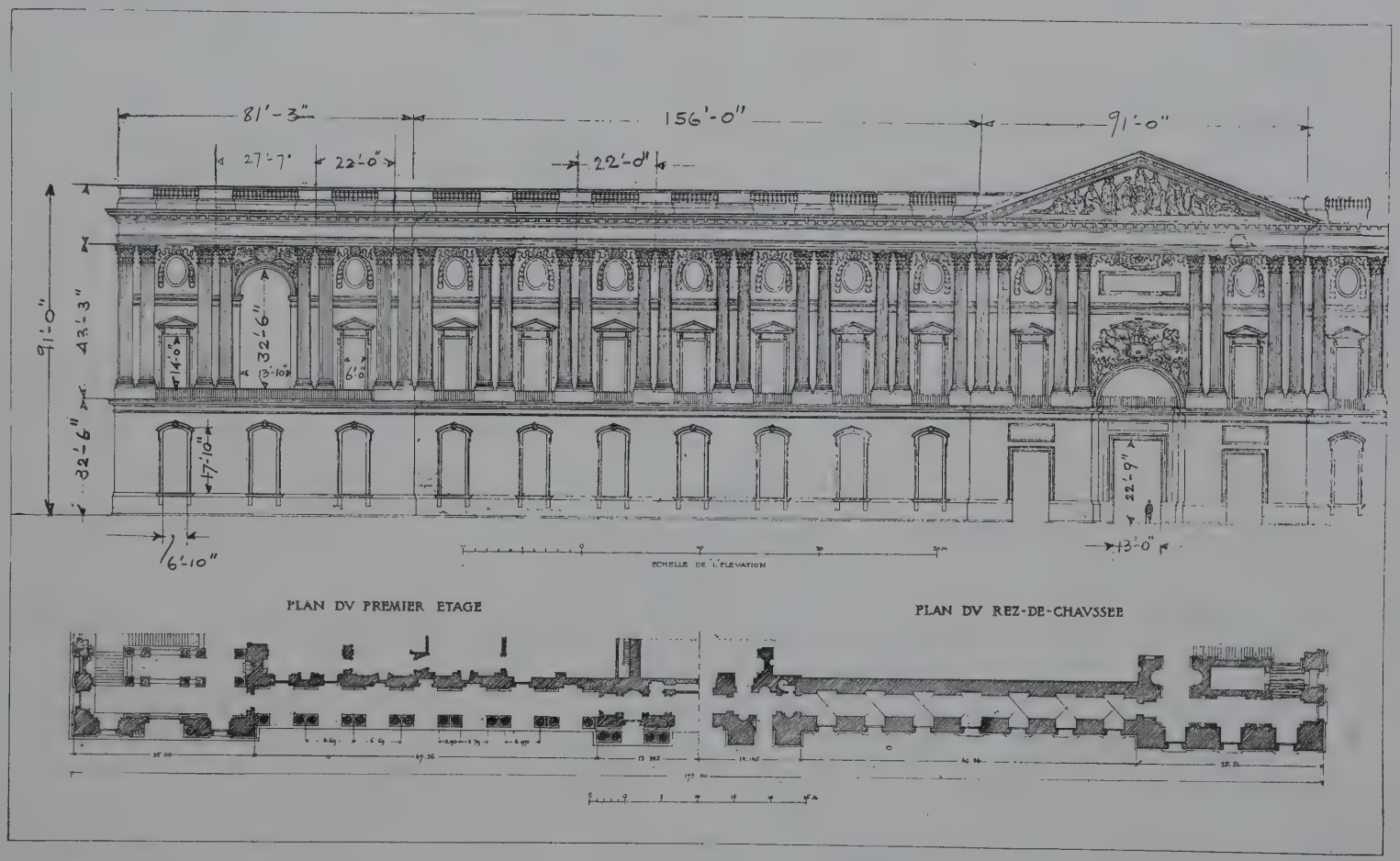


Figure 148. Plan and Elevation of Colonnade of the Palace of the Louvre, Paris. From G. Gromort's "Choix d'Eléments Empruntés a l'Architecture Classique." The large dimensions on the elevation are in feet and inches. The small figures on the plan give metric measurements.

a large one, we find that while one order is only two-thirds the height of the other, the distance from center to center of columns is about the same in each, so that the actual passage between the small columns is greater than between the large ones. There are examples of intercolumniations narrower than the Parthenon, and wider than the small temple of Cori. In general, in colonnades and in lintel construction, the greater the actual dimensions between supports, the narrower the proportion; the smaller the actual dimensions, the wider the proportion.

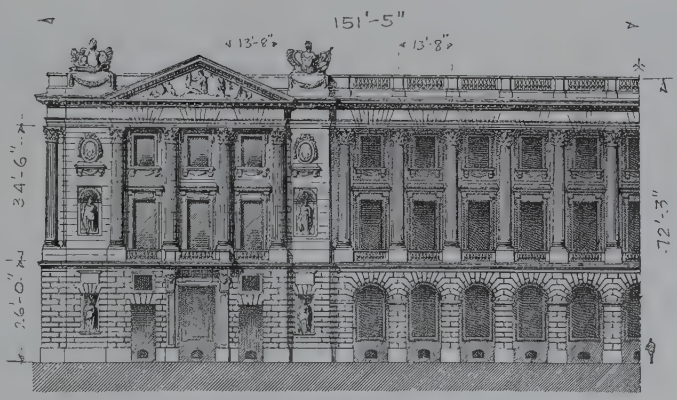


Figure 149. Colonnade of the Place de la Concorde, one half of the complete elevation, By Jacques Ange Gabriel. From Guadet's "Eléments et Théorie de l'Architecture."

A difference in the numbers of columns will also cause a variety in the proportion of colonnades. If a motive of façade is formed of two, of four, of six, or eight or ten columns, the proportions will become narrower and narrower with the increase in the number of columns—Figure 144. One reason for this is that the greater the number of passages to pass through, the narrower each one may be, while if there is only one such passage, as is the case when there are but two columns, it must be as large as possible. These, like all rules of proportion, are the result of generations of impressions and as we wish to produce in the spectator favorable impressions we search for these basic reasons in documents of good work, in order not to transgress them.

Coupled columns call for different proportions from isolated ones, since the two columns really form a single point of support, and may have a very much wider intercolumniation, as in Figure 148, the Colonnade of the Louvre, the masterpiece of Claude Perrault; we see here that the space between the sets of columns is a little over three diameters.

It is interesting to look at the actual sizes in this façade. The total length is 565 feet; this is a five-motive composition, consisting of a central pavilion, two end pavilions, and an intermediate portion between these on each side. The central pavilion is 91 feet wide, the end pavilion 81 feet 3 inches; each has *three bays,* averaging about 25 feet to a bay. The intermediate portion, 156 feet long, has *seven bays,* about 22 feet to each bay. Compare this with that other masterpiece in Paris, the Colonnade of the Place de la Concorde, Figure 149, reproduced at the same scale as Figure 148. It has a total length of 302 feet; this is a three-motive composition, with two end pavilions and an intermediate portion. The end pavilions are 65 feet 9 inches wide, and have five bays; the intermediate portion is 158 feet long and has *eleven bays,* the bays in each case being thirteen feet and eight inches. This building is in reality one of two which together form the end of the Place de la Concorde, and frame, between them, the vista of the church of La Madeleine. In these two examples the lintels are not made of a single stone, as in the classic examples, but are built up of voussoirs forming a flat arch. This allows a wider span than would be possible with a single stone lintel.

The figures are interesting as showing the difference in the number of single column motives and those with doubled columns, which may be used in a given length of façade.

It is interesting to note further the following dimensions of the Louvre and façade of the Place de la Concorde, which for convenience in comparison have been arranged in tabulated form below:

	Louvre	*Concorde*
Height of Column	43′ 3″	34′ 6″
Height of Base	32′ 6″	26′ 0″
Total Height	91′ 0″	72′ 3″
Ground Floor Windows, Height	17′10″	21′ 0″*
" " " Width	6′10″	9′ 9″*
Second Floor Windows, Height	14′ 0″	13′ 0″
" " " Width	6′ 0″	5′ 6″
Entrance Door Height	22′ 9″	19′ 6″
" " Width	13′ 0″	9′ 9″
Width of Typical Bay	22′ 0″	13′ 8″

(*Arched openings)

The proportions would have to be changed in either example if the columns rested on the ground instead of on a high base. Cover the base course in Figures 148 or 149, and you will see how heavy the proportion appears. The ground floor openings in each case count with the voids between the columns.

A study of documents, divider in hand, will in this manner give a very clear idea of how much "architecture" can be put into a given number of feet. A real understanding of the limitations of space will save one from making an esquisse, as is so often done, that is impossible of working up because it has been laid out with too many motives in a given dimension.

Figure 150. Fountain of the Acqua Paola, Rome. The arches in the central part are 40 feet 8 inches from center to center of columns.

Figure 151. Loggia dei Lanzi, Florence. These arches are 32 feet 6 inches wide in the clear.

THE CLASS B PLAN PROBLEM

Chapter XV

SIZE, SCALE AND PROPORTION—(Continued)

WE HAVE seen examples of the spacing of columns and the effect of this spacing on the size of motives. When we examine arched motives, we find a new scale of sizes. In general, we may say that *arched motives are larger than those of lintel construction,* and, consequently, that *fewer can be used in a given length of façade.* This is probably the result of the search for monumental effect as affected by the limitations of construction.

From time immemorial when man has wished to give the idea of grandeur, mere size has been one of the means of attaining it—size of mass, size of motive, size of element. When Cheops built his Great Pyramid 760 feet square at the base and 485 feet high, he doubtless made it as large as was possible with slave labor and forced levies.

But when this desire for size was applied in antique times to lintel openings, there was a limit imposed by construction: while the height could be increased at will, the width could only be made as large as the available stone for the lintel would allow. It is for this reason that columns of great height were necessarily placed close together (Chapter XIV) and that the *height of monumental doors in antique times is always great in comparison to the width.* Exceptionally large lintel stones are needed for doors even eight feet wide. For the largest opening of the Propylæa at Athens there were found pieces of marble 20 feet long—an extraordinary dimension for stone.

However, such limits could not long satisfy man's aspirations for size in architecture, and so finally the arch was discovered, in several places at about the same time, probably. As its reason for being was to make possible openings greater than could be covered by a single piece of stone, so its real function is in covering big openings—it is therefore a bigger motive than the lintel.

And while the lintel opening in becoming monumental becomes high without widening in the same proportion, the arch, on the other hand, has no limits of width, while its height is regulated by such considerations as the height of floor or rooms, possibility of inclosing with glass, etc. Therefore, *in arch construction the monumental aspect exists largely in the width.* The niche,—the small arch motive,—is always narrow and tall; the big arch is usually very wide. Compare the arches of the "Caroussel" of the Louvre, Figure 157, with those of the Garden of the Palais Royal, Paris, Figure 152. These arches are the same height. One easily sees which is the more monumental. Extreme width is reached in bridges, the widest expression of the arch motive.

The triumphal arch is an exception to this rule, and while it may be wide, the height is usually about twice the width. Guadet explains this in saying that such arches are made to idolize a single man, and therefore retain the proportion of a small arch, although increasing it greatly in size, while the usual arch of great size is accommodated to a crowd. (See table on page 113.)

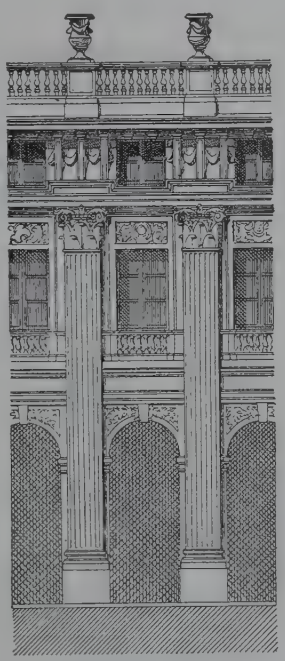


Figure 152. Detail of the Palais Royal, Paris. From Guadet's "Eléments et Théorie de l'Architecture."

Frequently one uses in the same building both lintel and arch motives. As already pointed out the arch is the form for the bigger openings, the lintel for the smaller ones. This does not apply to the decorative use of the lintel motive applied against a wall, where, as in Figure 145, it may frame an arch.

Let us now examine some buildings with arch motives and see how many motives occur in a given length of façade. To start with a big example, the Loggia dei Lanzi at Florence, Figure 151, is approximately 120 feet wide; in this space there are three arches, each 32 feet, 6 inches wide in the clear. The Loggia of the Piccolomini at Siena, Figure 154, much smaller, has three arches in the width of 63 feet, which gives 20 feet, 6 inches from center to center of column. The Mercato Nuovo at Florence, Figure 153, has four arched motives in a total width of 91 feet, 4 inches; 18 feet, 6 inches from center to center of columns.

The Acqua Paola at Rome, Figure 150, is a three motive composition in 186 feet, 8 inches; and of the central portion the arches are 40 feet,

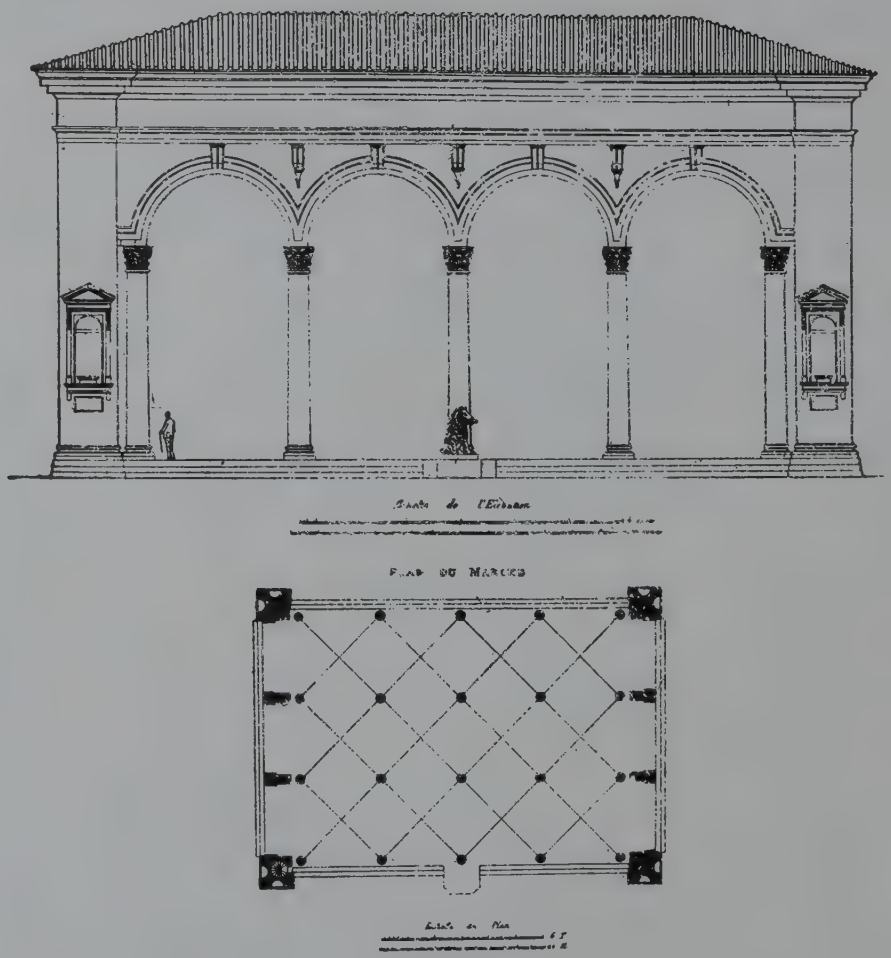


Figure 153. The Mercato Nuovo, Florence. The arcade is 18 feet 6 inches from center to center of columns. From "Architecture Toscane," by Grandjean de Montigny et Famin.

Figure 154. Loggia of the Piccolomini, Siena. This arcade measures 20 feet 6 inches from center to center of columns. From Grandjean de Montigny et Famin's "Architecture Toscane."

Figure 155. Elevation of the Pandolfini Palace, Florence. From "Architecture Toscane." The arcade is thirteen feet from center to center of columns.

Figure 156. Palace of the Villa Medici. Façade toward the garden. The arched opening of the loggia is 16 feet 10 inches wide, the lintel opening 12 feet, measurements being taken from center to center of supporting columns.

Figure 157. Arches of the Caroussel, the Louvre, Paris.

8 inches, from center to center of column. From these examples, it can be seen that the arch, especially when used as an opening, is a big motive in composition. In courtyards it may well take a small scale. (See table of sizes below.)

In the Court of the Pandolfini Palace at Florence, Figure 155, the loggia is 13 feet from center to center of arcade, while in the cloister of the church of S. M. degli Angeli at Rome, Figure 159, the distance from center to center of arcade is as little as 10 feet, 11 inches; and in the little individual gardens of the monks (shown in the upper corners of the same illustration) it is only 7 feet, 4 inches, from center to center, a quite impossible size for arches, except in such a tiny and intimate court.

It is interesting to compare such figures with some in which the so-called "Palladian motive"—an arched opening between two lintelled ones—is used. Perhaps the best known is that of the Villa Medici, at Rome, Figure 156, in which the arch opening is 16 feet, 10 inches, from center to center of column supports and each lintel opening 12 feet from center to center of columns.

Figure 158. Detail of Basilica of Vicenza. From Gromort's "Eléments d'Architecture Classique."

In the basilica at Vicenza, Figure 158, where Palladio himself used this motive, the arched opening is 13 feet from center to center of column supports, and the lintel opening 5 feet from center to center of column. In the Morgan Library in New York, by McKim, Mead & White, Figure 161, the arch motive is 14 feet from center to center of column supports, the lintel motive is 9 feet from center to center of column.

These examples of size will be found of great value, especially if they be memorized, so that one will know instinctively how much "architecture" will fit *properly* into a given length of façade, or portion of façade. A better way to acquire an architectural "size consciousness" than to memorize the figures here given, would be for the student himself to hunt for examples in the architectural documents, such as Letarouilly's "Edifices de Rome Moderne", or Grandjean de Montigny and Famin's "Architecture Toscane", measuring motives and noting them in table form—lintel openings in one column, single arched openings in another, arcades in a third and so forth.

Sizes of Courts With Arcaded Motives.

Court	*Length of Court*	*Number of Arched -Motives*	*Center to Center of Motive*
Cancelleria Palace, Rome	108′	8	13′
College Piceno, Rome	36′	5	7′ 6″
Angelo Massimi Palace, Rome	28′	3	9′ 6″
Pitti Palace, Florence	165′	7	22′ 9″
Strozzi Palace, Florence	59′	5	12′
Boston Public Library	106′	9	12′

Dimensions of Triumphal Arches.

Arch	*Height of Structure*	*Width*	*Depth*	*Height of Opening in Clear*	*Width in Clear*
Arc de l'Etoile, Paris	160′	146′	72′	67′	46′
Porte S. Denis, Paris	81′	82′	16′	50′	26′
Arch of Titus, Rome	50′	45′ 6″	20′	26′ 6″	17′ 6″
Arch of Septimus Severus, Rome	75′	82′	35′	39′ *(Central Opening)*	21′ 9″
				24′ 8″ *(Side*	9′ 4″ *Opening)*
Washington Arch, New York City	74′	57′ 6″	18′ 9″	48′	30′
Washington Arch, Valley Forge	62′	54′	23′	33′ 6″	20′ 6″

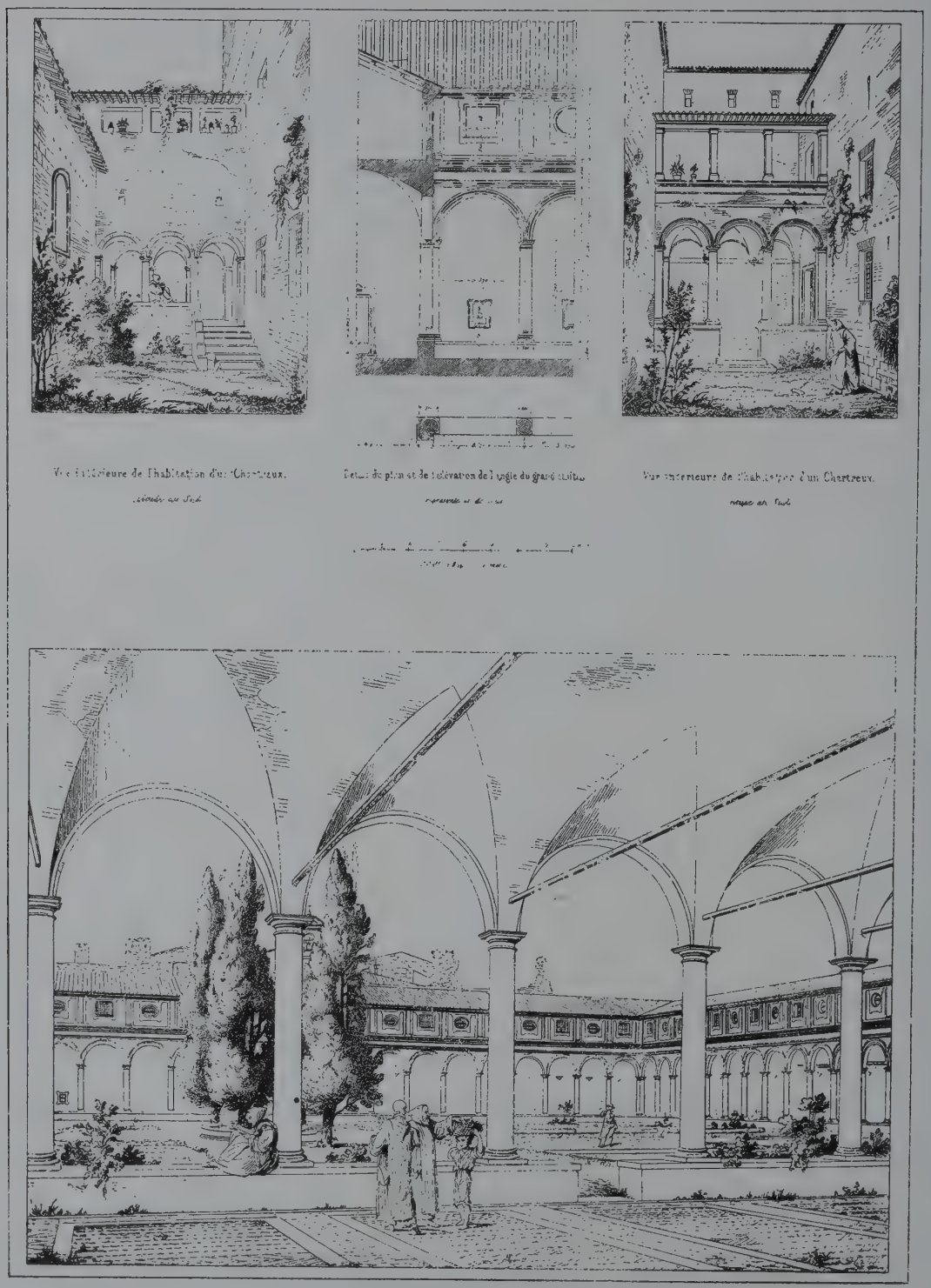


Figure 159. Cloister of the Church of S. M. Degli Angeli, Rome. The arches of the cloister measure 10 feet 11 inches from center to center of columns. The arches of the small courts shown above are 7 feet 4 inches, measuring from center to center of columns. From Letarouilly's "Edifices de Rome Moderne."

THE CLASS B PLAN PROBLEM

Chapter XVI

SIZE, SCALE AND PROPORTION — (Concluded)

IN THE two previous chapters we have studied the sizes of various architectural motives; we have seen how they vary, both in size and in proportion, within certain limits. To complete this study, let us look at two façades in their entirety—that of the Pierpont Morgan Library in New York, Figure 161, and that of the Butler Art Gallery, at Youngstown, Ohio, Figure 162. They are of the same length, 120 feet, and are here reproduced at the same scale: they are particularly interesting as being so nearly the type and size of an average Class "B" plan problem. Each façade is of the three-motive type, and in each the central motive is sub-divided into three; in each case the central motive is a loggia, and in each a niche forms the principal feature of the end motive. The arches of the Butler Art Gallery are fifteen feet from center to center of column; the central arch of the Morgan Library is, as we have seen, slightly less, fourteen feet from center to center of column. These are particularly good examples to study for their scale and proportion, which are excellent, and also for the careful use of detail, of moulding profiles, and of the placing of ornament where it will be set off by contrasting surfaces of blank wall. As is usual, the line drawings hardly do justice to these carefully studied buildings, which depend for their effect on proportion, on beauty of execution, and the judicious placing of a small amount of ornamentation, rather than on a profusion of ornament and a complication of lines. The photograph of the Butler Art Gallery as completed, Figure 164, will show how beauty in good proportions is brought out in executed work. This Morgan Library is so well known as to need no further illustration.

We need give no other examples. The value to the student will be in his making such a study of size and scale and proportion himself, devoting an evening to this purpose during the early stages of each problem.

In speaking of proportion so far we have used only terms of façade; however, all study of proportions is regulated by the proportions of interiors. The natural order of study, for any program, is to make first a tentative disposition of the rooms and spaces required—that is the plan. Then must be determined the necessary heights of stories, of windows, of roofs—that is the section. In reality the *plan is only a horizontal section, the section a vertical plan, and these two have as their resultant, a façade.* The first study of façade will, of course, cause modifications here and there in plan and section; each of these studies—plan, section, elevation—is the complement of the others; they cannot be treated as successive phases of study.

The usual error is to make motives too small in scale—to crowd too many into a given number of feet. It is also a mistake to go to the opposite extreme; extravagant proportions do not give grandeur in composition. This grandeur of aspect is obtained partly by simplicity and unity, but also by the number of elements—a long façade should have a greater number of "bays" than a short one. Thus, the façade of the Palace of Versailles, fronting on the park, Figure 163, is very simple in composition and grand in aspect, but notice how many bays are contained in the projecting central portion alone—23 bays in 330 feet. The effect of grandeur is here produced by the multiplicity of motives—and these motives are large, quite large. If the number of bays had been reduced to a few there would not have been the same effect of grandeur, even though the total façade had remained the same in size. It is for this reason that it is so important to know what is the proper size for a motive.

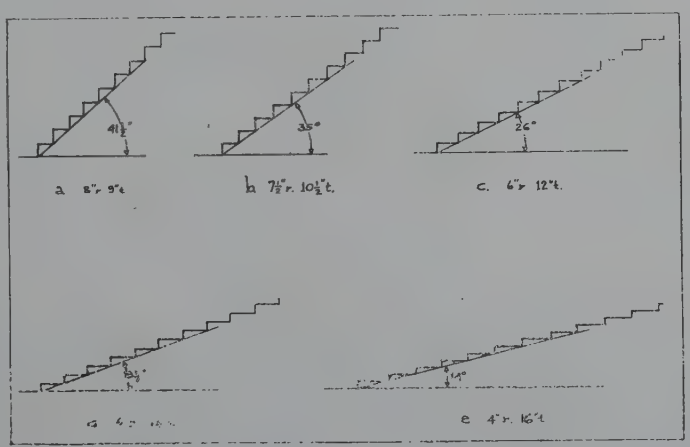


Figure 160. Sections of Stairs.

It is well to remember in this connection that while some architectural elements may vary greatly in size — that a column may be

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Figure 161.

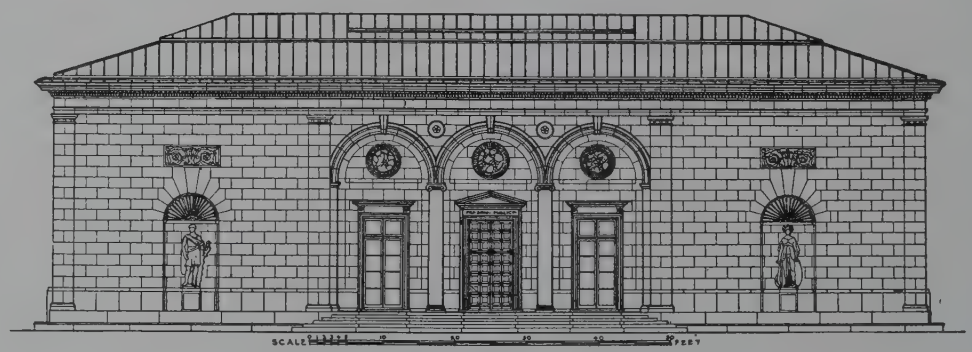

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Figure 162.

Figure 161, Façade of The Morgan Library, New York, and Figure 162, Façade of The Butler Art Gallery, Youngstown, Ohio, are Reproduced at Reduced Size From the "Monograph of the Work of McKim, Mead & White."

Figure 163. Palace of Versailles. General View of Front on the Gardens. From Paul Favier's "L'Architecture et la Décoration aux Palais de Versailles et des Trianons."

six or sixty feet high, an arch five or a hundred feet wide—there are other elements that are fairly constant, because they are related to human uses. Thus a balustrade is usually from three to four feet high. The portico of the church of St. Peter at Rome, Figure 193, has a balustrade of six feet in height, but this structure never shows its great size; there is quite a shock when one mounts to the roof and sees a human figure standing beside the balustrade.

When a greater height than four feet is needed for architectural effect, where a balustrade is used to crown a building, for instance, it can be set on a pedestal as in Figure 194, the building of the Chamber of Deputies, Paris, and as is also done in the Seventh Avenue façade of the Pennsylvania Railroad Station in New York City, so that the height of the motive may be proportioned to the scale of the composition, while the balustrade still retains its proper relation to human sizes.

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Figure 164. Photographic View of the Front of the Butler Art Gallery, Youngstown, Ohio. From the "Monograph of the Work of McKim, Mead & White."

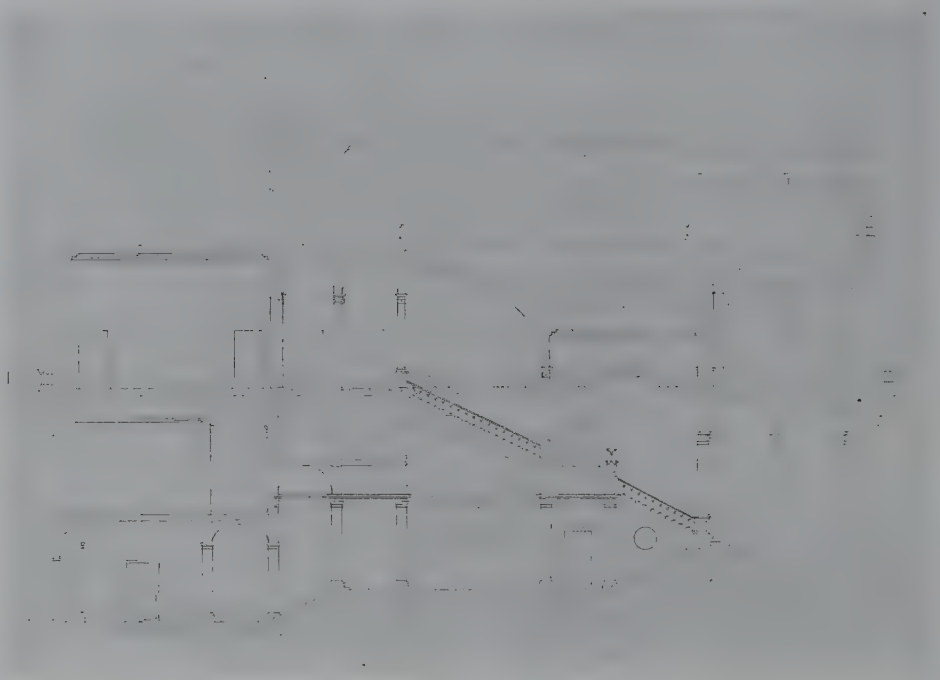

Figure 165. Section, Palazzo Balbi, Genoa. From Reinhardt's "Palast Architektur Italiens, Genua."

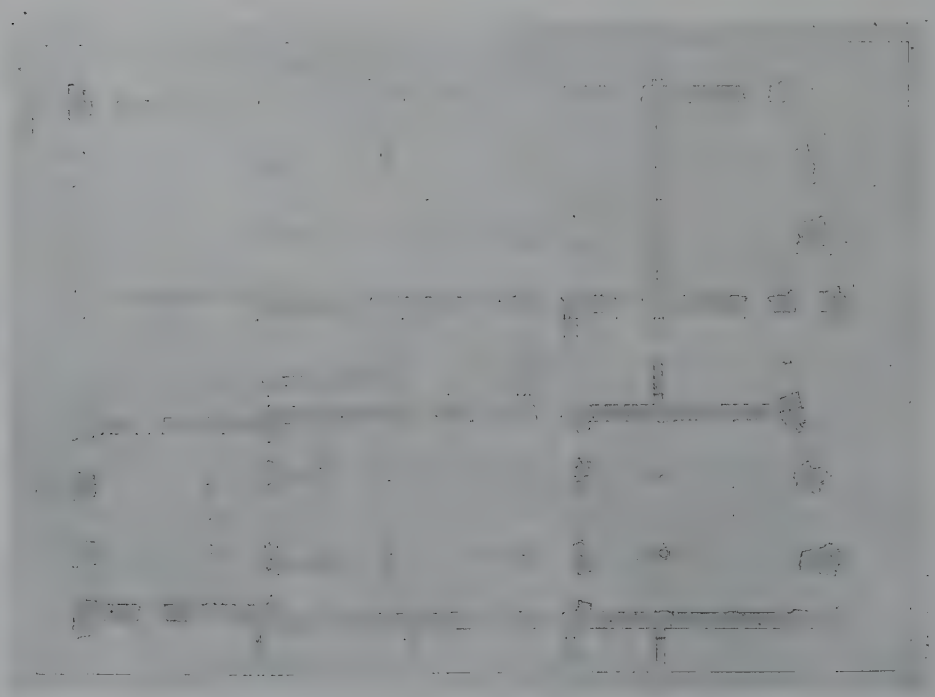

Figure 166. Ground Floor Plan, Palazzo Balbi, Genoa. From Reinhardt's "Palast Architektur Italiens, Genua."

Steps also have their relation to human uses; they are not a detail, but have an active and striking effect on design; many times sections are drawn showing ornate, complicated architectural motives surrounding a stairway which by reason of the size of the rise and tread of the stair, the angle from top to bottom, is nothing but a slide.

Fire and panic laws prevent a stair being made steeper than 8-inch rise and 9-inch tread—which gives the angle shown in *a*, Figure 160. Note the slope; it is the steepest that can be used for a service stair or a fire tower. A domestic stair—by that I mean the stair in a small house or bungalow—is frequently made with 7½-inch rise and 10½-inch tread, as shown in *b*, Figure 160; in the better class of such work the figures are more apt to be 7-inch rise, 11-inch tread. The stair so conveniently laid out with a scale, with 6-inch rise and 12-inch tread, is shown in *c* of the same figure. These are not "monumental" stairs and they are not suitable for the important vertical communications of monumental buildings. For such a stairway, a 5½-inch rise with a 13½-inch tread, or a 5-inch rise and a 14-inch tread as shown in *d*, Figure 160, is proper.

The effect of these different slopes on a section is considerable. In the first place, the lower the individual riser, the greater the number of risers which will be required to compass a given height, and hence the greater number of treads required, and as, in general, the decrease in size of rise is accompanied by an increase in size of tread, it is easily seen that *the more monumental the stairway, the greater becomes its total length,* the total height being constant.

For an outside stair—the steps to a public building, or steps in a city park—an angle such as is shown in *e*, Figure 160, with a rise of 4 inches and tread of 16 inches is proper and fitting. Such stairs are not uncommon abroad. While in this country we have been in the habit of making our stairs too steep, possibly because of our great dependence on the elevator, in Europe, they have been generally studied for monumental effect. The following table of examples is of interest in study:—

INTERIOR STAIRS

Example	*Height of Rise in Inches*	*Width of Tread in Inches*	*Angle of Slope in Degrees*
FRANCE			
Louvre (Escalier de la Colonnade)	5¾″	15¾″	20
Versailles (Escalier de Marbre)	5½″	15¾″	19
Invalides (Great staircase designed for invalid veterans)	4¾″	15″	18
Luxembourg (Escalier de la Présidence)	5⅜″	14½″	20
Hotel des Monnaies	6″	13″	25
ITALY			
Rome, Farnese Palace	5¼″	21¼″	14
Rome, Borghese Palace	5⅜″	16⅛″	19
Rome, Vatican Palace	4¾″	16″	16½
Rome, Vatican Museum	4½″	14½″	17½
Venice, Ducal Palace, Giant's Stair	5¾″	12″	26

These examples will show that in monumental architecture the slope of stairways is very gentle. Exterior stairways should be still more gentle in slope. The following table will be of value:—

EXTERIOR STAIRS

Example	*Height of Rise in Inches*	*Width of Tread in Inches*	*Angle of Slope in Degrees*
Versailles, Stair of One Hundred Steps	5½″	15¾″	19
Fontainebleau, Court of Honor Perron	4¼″	16¼″	15
Palais de Justice, Court of Honor Perron	5¼″	16⅛″	18

Many of the palaces of Genoa, built on hillsides, show the beauty that may be given by a well designed stair. That in the Balbi Palace, Figure 165, is a most interesting arrangement; it shows the very considerable place that stairways occupied in Italian Renaissance buildings: this stair is shown in plan in Figure 166.

To mention one or two fine examples in this country, the main stair in the Pennsylvania Railroad Station, New York City—the stair from the big central waiting hall to the passage to Seventh Avenue—has a tread of 17 inches and a rise of 6 inches, to which must be added one-half inch of slope in the tread; and the monumental flight of steps across the front elevation of the new post-office building, New York City, has a tread of 18 inches and a rise of 5¼ inches with a one-quarter inch slope in the tread.

Do not be satisfied with these examples alone. Make your own study of sizes in the documents. Measure the rise and tread of stairs in well executed work of all types of buildings in which you have such an opportunity. Note these in table form as suggested for arch and lintel openings.

We must also remember that floor height plays a very important role in the question of scale. Small domestic buildings with a clear height of eight or nine feet, will give in façade very different character from the more pretentious city residence with its clear floor heights of twelve feet or more, and, in turn, monumental buildings with vaulted rooms from thirty to sixty feet in the clear, or more, will immediately affect the design of elevation; in these latter buildings, lower floors or parts of floors are introduced for service spaces—for functions which are not "monumental," in fact, and which are only used by the force belonging to the building.

In very high buildings the so-called "typical" floor, which makes up the largest part of the building and occupies most of the total height of the façade, is standardized by the question of cost on the one hand, of light and air, etc., on the other; this height is in the neighborhood of eleven feet six inches to twelve feet, from floor to floor.

In conclusion, let me again borrow from Guadet: "Study pure drawing as much as possible. Proportion plays an immense role in the study of architecture; the sense of proportion is first of all an artistic sense, and nothing develops the sense of proportion as does the exercise of drawing."

Proportions in architecture are difficult and delicate—they are even more so in nature; among a thousand faces there are not two identical, and yet they are all made on the same "program"—the composition is the same—it is only a question of proportions. And what is it to be able to draw? It is to perceive and then to express the specific proportions which distinguish and particularize the subject. He draws best who is able to perceive these proportions accurately.

This ability is best developed by sketching from executed work—to sharpen the perception of form of mouldings and sizes and proportions—and sketching from nature to absorb ideas in rendering and presentation.

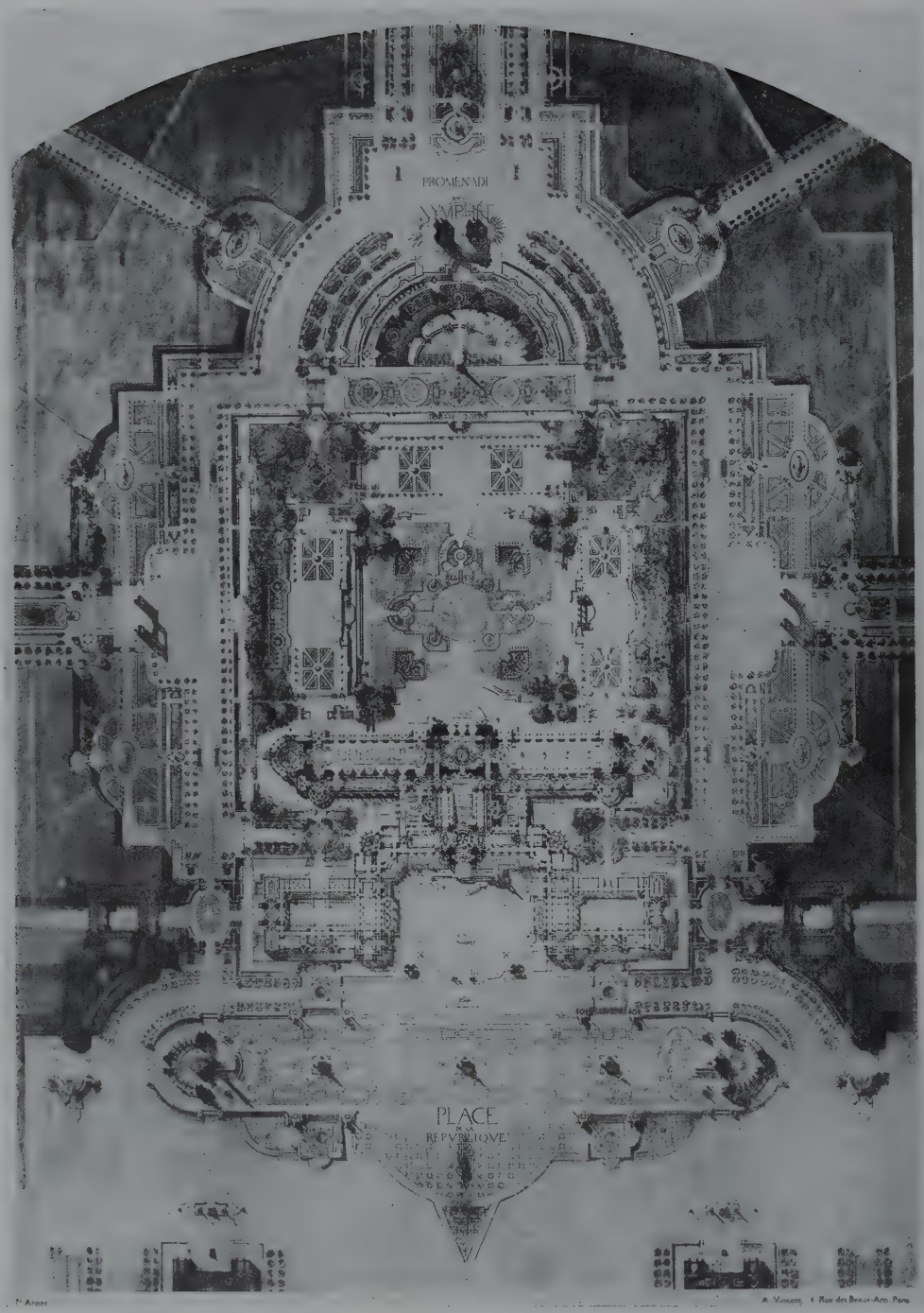

Figure 167. "Un Palais de la Presidence dans la Capitale d'une Grande Republique." Placed Second, Grand Prix de Rome, Ecole des Beaux Arts, Paris, 1912-13, M. Gaston Castel, Pupil of M. Bernier.

THE CLASS B PLAN PROBLEM

Chapter XVII

STUDYING BY MEANS OF MOSAIC

ARCHITECTURAL students are all more or less familiar with the term "mosaic" as applied to the garnishing of a plan, of making a telling and effective presentation of an idea or a parti in plan. Just why or how it should be used for this purpose is not so generally understood, but they know the value of a number of lines within a plan, representing a floor here, or a ceiling there, or the furniture in a room.

But before a problem has reached the presentation stage mosaic has a value in the study of a plan very similar to the use of "grays" in the study of elevations. This is its use in the study of a scheme, of the "circulations," and of the working of a plan to solve the conditions of the program. For this purpose, of course, the mosaic is "indicated," rather than drawn.

This is, in reality, composition —composing with whites and blacks, and various intermediate grays. In every case successful mosaic is successful because it helps to explain the big idea of the parti. Now, the final presentation can never be successful unless the "effect"—the composition of whites and blacks and grays—is kept in mind from the early stages of the study, long before the presentation drawings are thought of. This is of equal importance with the study of "poché" —the study of the walls—for it should always be borne in mind in studying a plan, that *one should consider the rooms, as enclosed by walls, rather than the walls.*

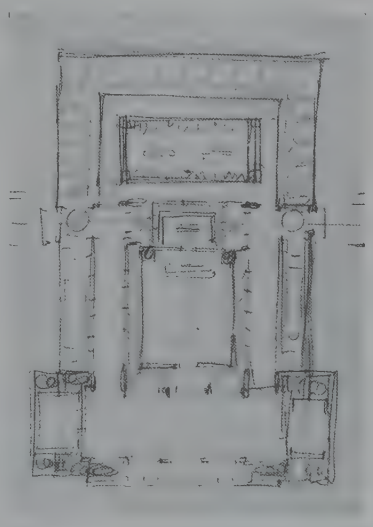

Figure 168.
A Study of Plan, by Paul Cret.

Figure 169. An Elevation Study, by Pope Barney.

It is much easier to study effectively by masses of grays than by little points of poché!

Figure 169 is a typical study of elevation; here we see the balustrade, the band course, the window grilles, indicated by series of running spirals in pencil—usually smudged with the finger into a "gray"—to represent in a *study of proportions,* the position of ornament that will be *later studied in detail and drawn,* or in some cases, perhaps, omitted if study shows it to be in the wrong place. To *draw* such details at such a stage in the study of elevation would be a foolish waste of time needed for other phases of study.

In the same way in Figure 168 we see an early study of a plan —a criticism by Paul Cret of a student's plan for a "Supreme Court Building." Here the "circulations" are left white, the other portions grayed in in various ways, none of which requires careful drawing. This aids in visualizing a scheme so that the disposition of the different portions of a plan may more effectively be made.

In studies, such indication of mosaic should follow a use of T-square and triangle in laying out the big lines of the plan—the axes first, and the principal lines of the walls. Put these in place and, poché blackened in quickly with a brush or with pencil, the "effect" should be sought by indicating mosaic.

Note the effect obtained in Figure 170, one of the studies of plan made by Grant M. Simon in competition for

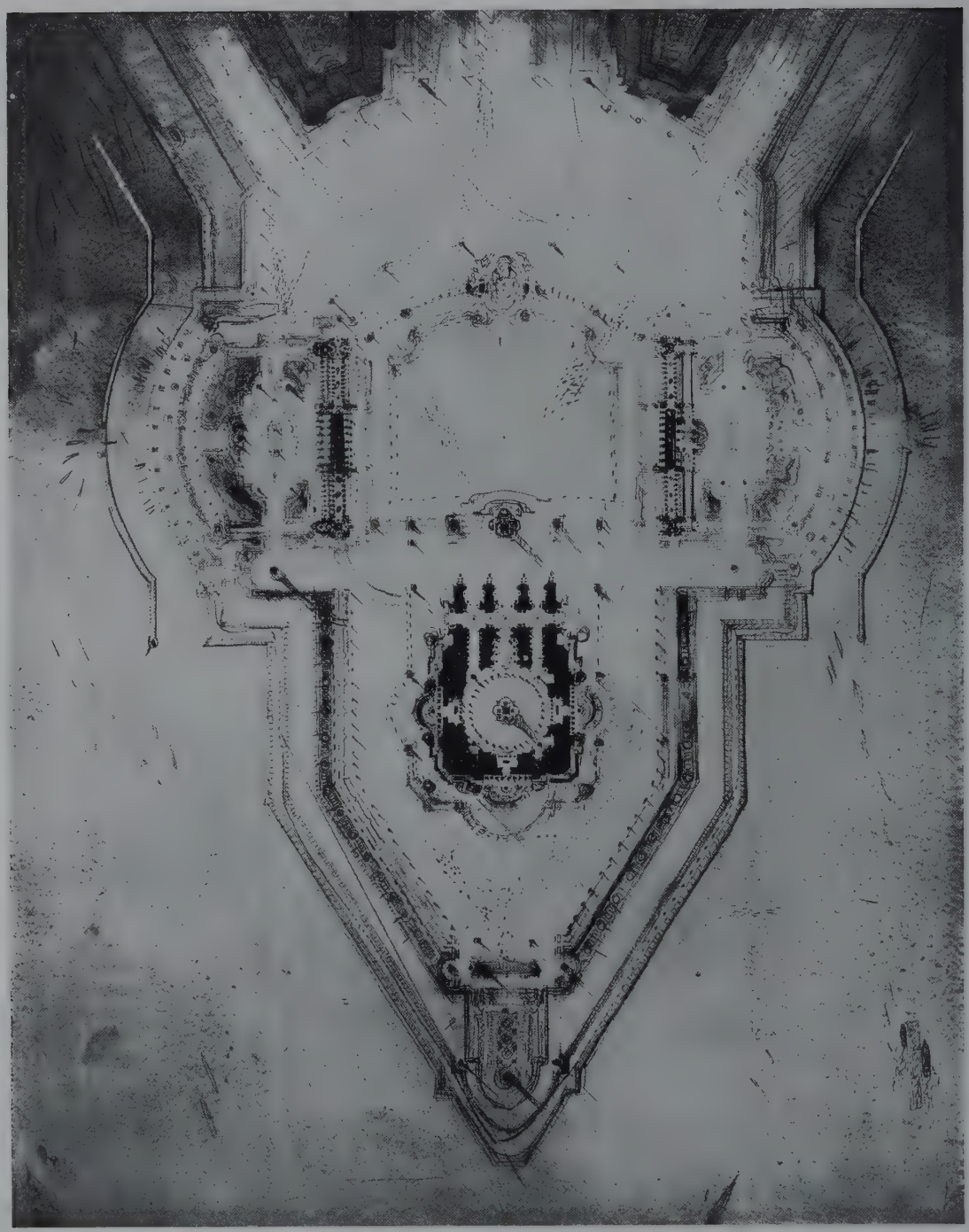

Figure 170. Plan Study by Grant Miles Simon for the Design with which he won the Paris Prize in 1913. Subject "The Monumental Treatment of the Lower End of Manhattan Island." Compare this with his final Drawing on the opposite page. This study was at a scale one-quarter of the final scale, and therefore this drawing was in area only one-sixteenth the size of the final plan shown opposite.

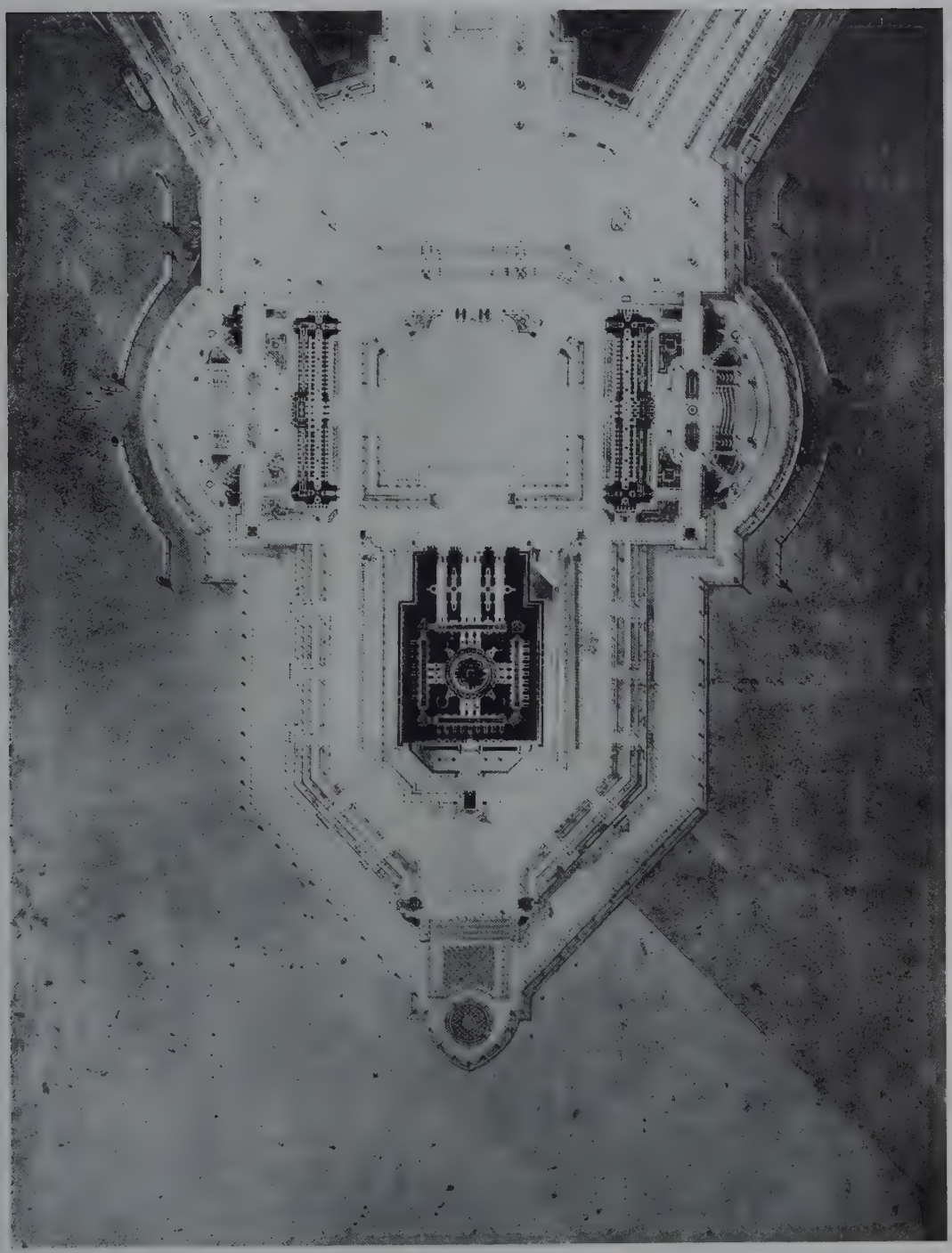

Figure 171. Final Plan of Design by Grant Miles Simon, Winner of the Paris Prize of The Society of Beaux-Arts Architects in 1913. "The monumental treatment of the Lower End of Manhattan Island." Compare with rapid study on the opposite page. Note effectiveness of the latter.

the Paris Prize in 1913, which he won. Compare this sketch, a work of a few hours only, and done at a small scale, with the final plan, shown in Figure 171, on which the actual drawing and presentation required nearly two weeks' time. The *effect* is almost as convincing in the sketch as in the final drawing.

When this manner of study becomes a habit, and in the studies an attempt is made to approximate rapidly the final presentation, mistakes in plan, uncomfortable corners, unsatisfactory arrangements, are made visible when they may be altered, while there is still time for study, and before the final paper is reached — avoiding the rubbing out and sponging out of mistakes that would not otherwise show themselves until that time.

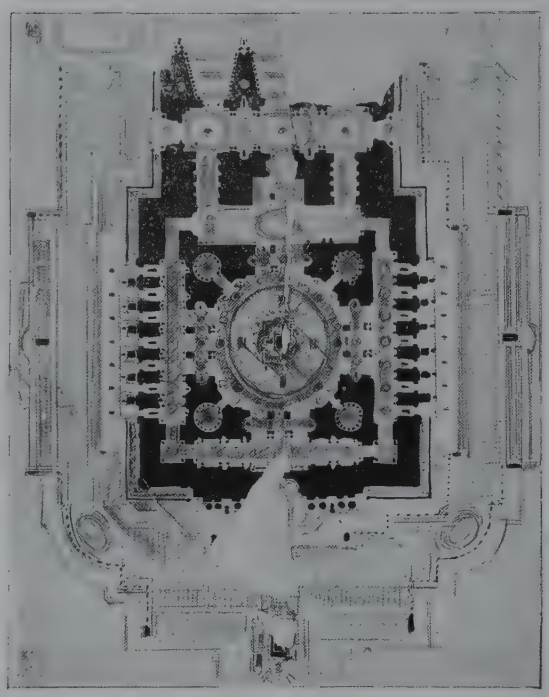

Figure 172.

Figure 172 is another study of plan (a damaged but interesting document) for this same competition, of the monument only, and this time the study was made at the final scale—the scale of presentation. While the mosaic is represented by squares, circles, etc., what is important is that there are "fields" of light or dark, "bands" of different values of grays, that are *composed* —studied as parts of a composition, and for their effect in setting off, in expressing, the big idea of the parti.

This use in study is similar to the use of mosaic in a sketch problem. Note in Figure 174, a twenty-four hour sketch submitted in the Labarre Competition in the Ecole des Beaux Arts, the way the mosaic is used in bands of gray to make a composition. This may also be seen in Figure 142 in the plan by the same author submitted in a preliminary competition for the Prix de Rome, and Figure 141, by Delaon.

It is impossible to overestimate the value of this study of "effect." In small scale studies the mosaic may be indicated in pencil. In plans at large scale it is possible to arrive more quickly at an effect by using charcoal, or charcoal and chalk, especially in the study of the mosaic outside of the plan, the "entourage," as it is called, as we shall see a little later.

Now, as to the form of this mosaic indication: there should be a big scheme underlying it, to explain the parti. In some cases the "circulations"—corridors, lobbies, etc.—are left white, and the various rooms grayed in, as in Figure 168. Of course, this will also be true of the finished drawing, as may be seen in Figure 175, by Castel, one of the masters of mosaic indication among the recent students at the Ecole des Beaux Arts at Paris. In a finished drawing of course, "whites" are only white by contrast with the darker bands, and themselves may have a considerable amount of drawing, as in parts of this plan. This scheme may also be seen in the plan of Hébrard. Figure 137. Or the scheme may be reversed, and the circulations heavily mosaiced, as in the reception portion of the plan for a presidential mansion shown in Figure 167, also by

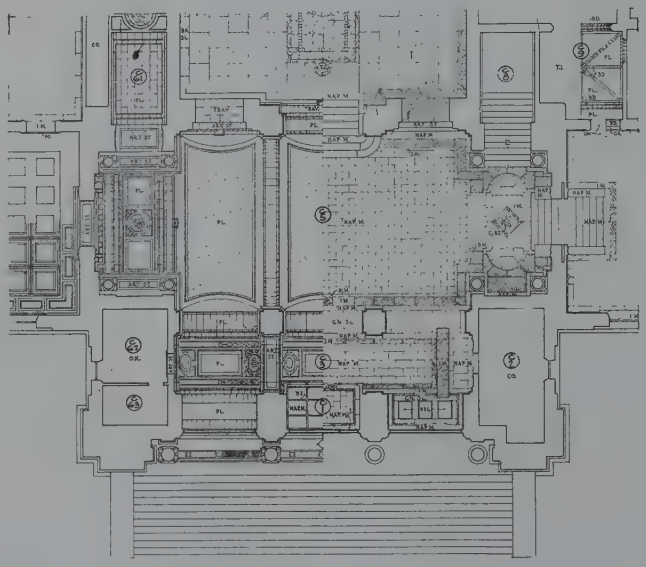

Figure 173. Entrance Vestibule, Detroit Institute of Art. A portion of contract drawing, showing half floor plan, half ceiling plan, of each space.

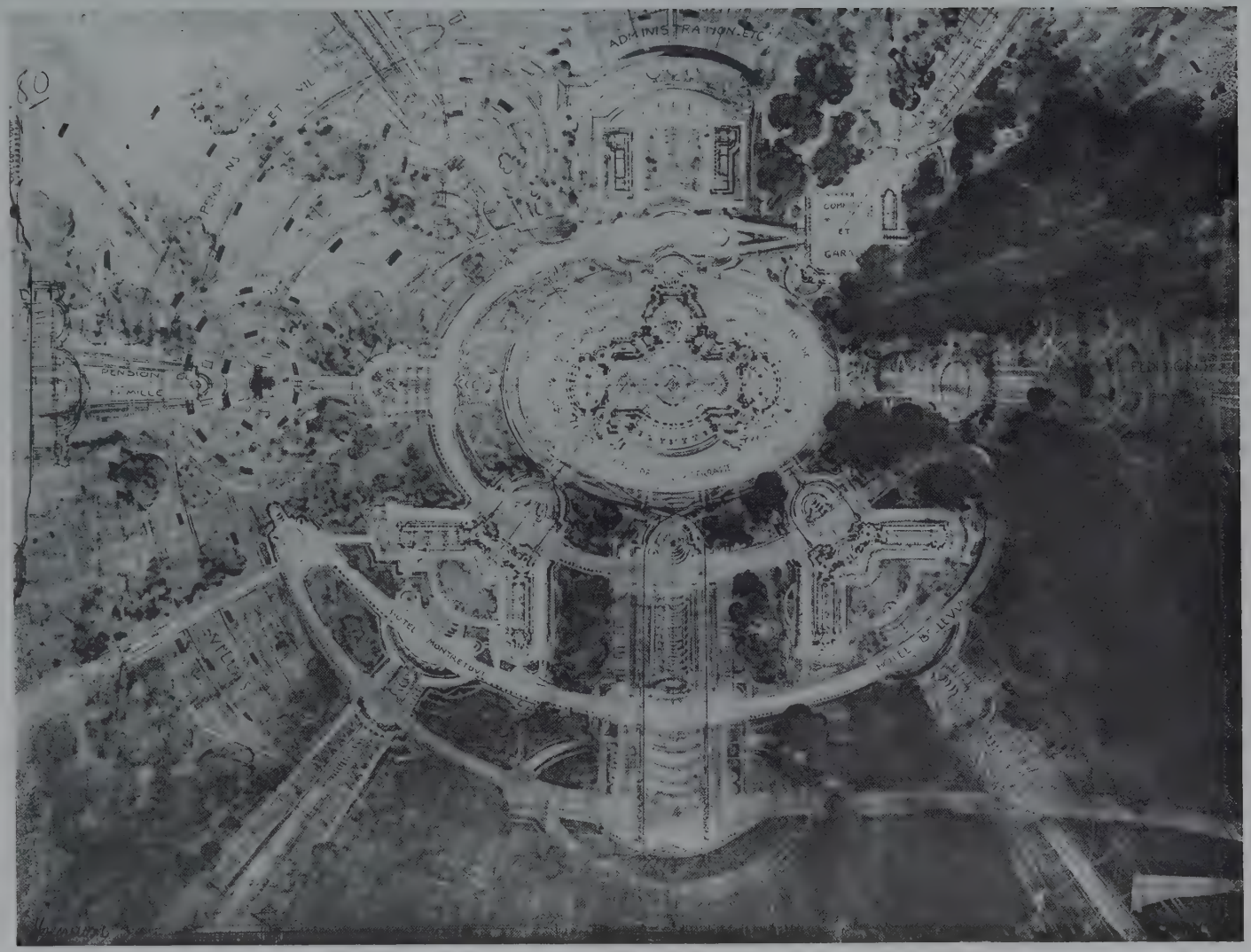

Figure 171. "Une Station Estivale," Concours Labarre, Ecole des Beaux Arts, Paris. Mention. M. Roger Expert, Pupil of MM. Redon and Umbdenstock.

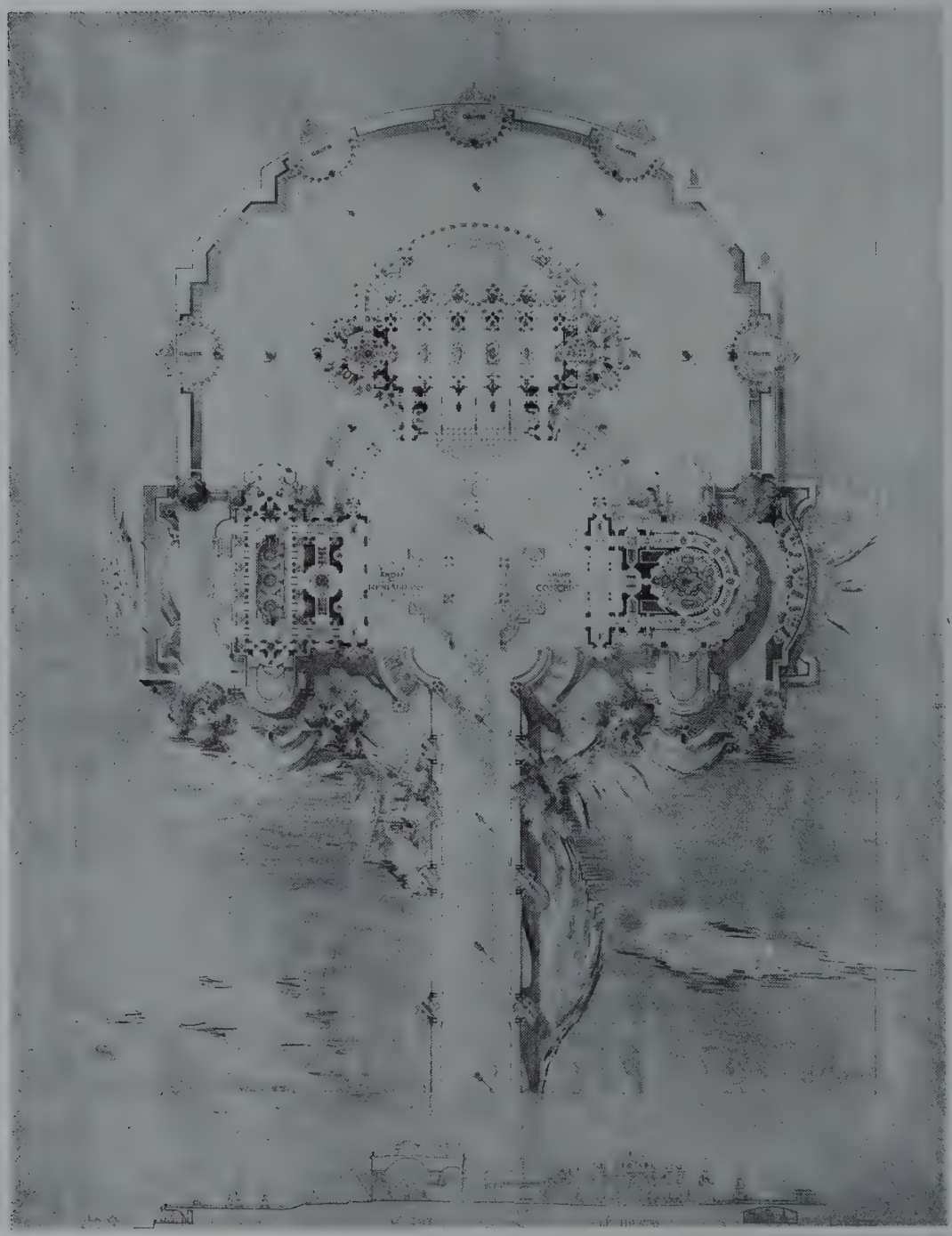

Figure 175. "Une Jettée-Promenade," Prize Design by M. Castel, Pupil of M. Bernier. Ecole des Beaux Arts, Paris, Concours Americains, 1912-13.

Castel. The important thing to remember is that the mosaic must, with the poché and rendering, form a composition.

Within this composition it is customary to indicate which are the important rooms by the richness of the mosaic — for mosaic may be rich in color and drawing whether it is to count as a light or a dark —by the character of the drawing and the contrasts between the light and dark bands. Note the almost jewel-like appearance of the center of the monument in the Simon Paris Prize plan, and in various portions of the two plans by Castel, Figures 167 and 175.

While these are all very rich in lines, and the mosaic is small in scale— and student work in general should be so—it is the custom in competitions for actual work, and in studies in offices for projected work, to use a much simpler form of mosaic, limiting it to that which really is to occur in the building — simple floor patterns, or ceiling diagrams. But even here, though the lines are simple, they must in the same way be composed; i. e., they are part of the architecture, which, of course, is "composed". In this connection it is interesting to study Figure 173, a reproduction of a portion of a contract drawing for the new Museum of Art in Detroit.

While "mosaic" in school work is frequently a "convention" and does not have an exact relation to the actual facts of a building as it would be built, measured layouts of executed work are often quite beautiful as examples of mosaic. Such a plan is that shown in Figure 176 — the "Monument Commémoratif". This is simply a truthful ceiling plan. In a project it is usually more effective, *in expressing a parti,* to use ceilings in important rooms only, and more especially in rooms that have a festive purpose — ballrooms, reception rooms, grand staircases, and so forth. In Séassal's Grand Prix Plan, Figure 181, we see such a mosaic of ceilings in the ballroom and in the reception rooms at either end of the garden front. The contrast of this richness in these places with the less showy mosaic of the rest of the plan is one of the means of explaining the working of the parti.

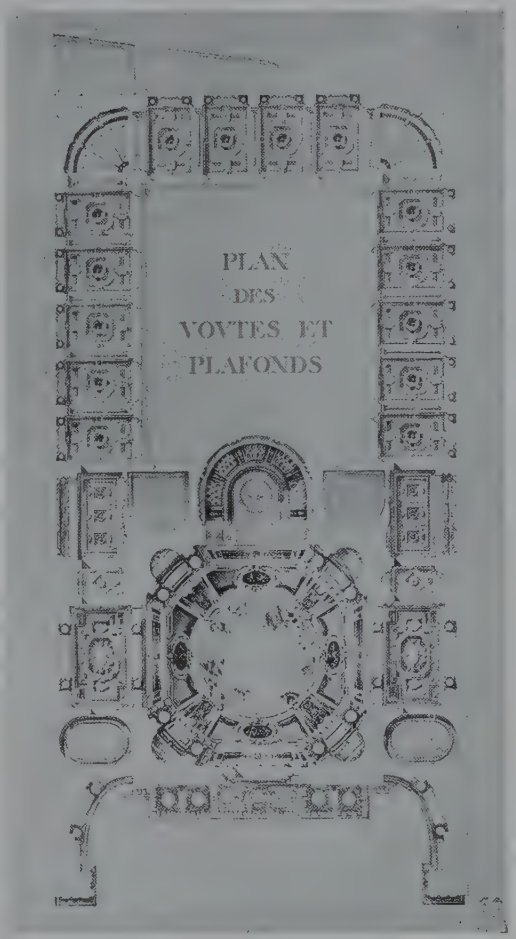

Figure 176. Monument Commémoratif, Paris, A. Guilbert, Architect.

When the poché of a plan is not darkened, but is left as a "white", as in Figure 177, the task of "composing" the plan with the mosaic—to get an "effect", a picture — is much more difficult, but sometimes very interesting.

It is sometimes necessary to add interest to a plan composed almost entirely of useful rooms; at such times one's ingenuity is given a real test. In the printing establishment of Coutan, Figure 253, we see a mosaic made by the indication of printing presses, type setting machines, and other appropriate paraphernalia. This idea was used in a more elaborate way by Kirkpatrick in his Paris Prize plan for a printing establishment, Figure 254; we see that a mosaic composed in this manner of conventionalized forms of machinery may nevertheless be intensely interesting, and quite satisfactory as expressing the idea of the parti.

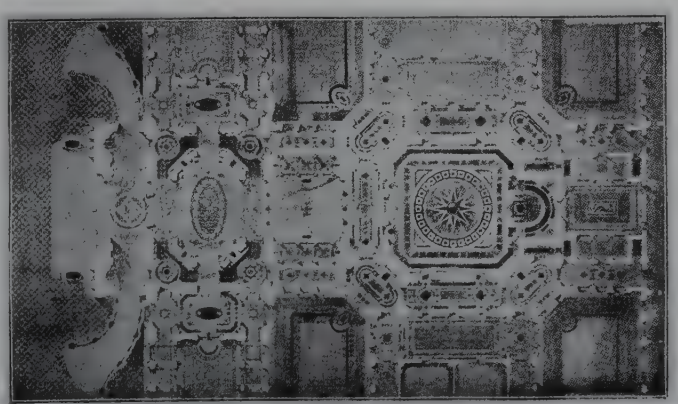

Figure 177. Entrance to a Museum, M. Jules Pin, Architect.

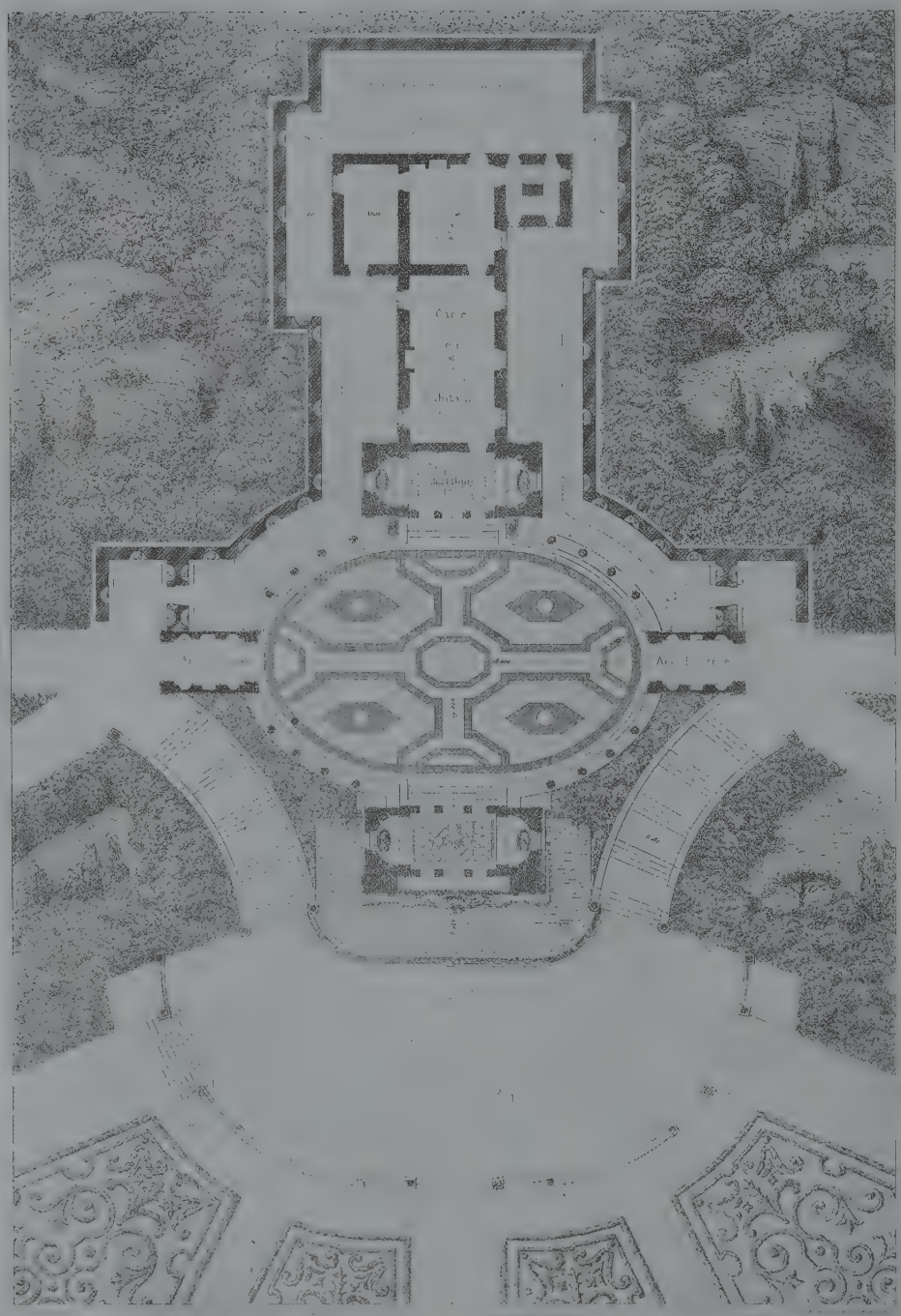

Figure 178. Plan of the Villa Pia in the Vatican Gardens, Rome. From Letarouilly's "Vatican." For elevation from the lower terrace see Figure 63.

THE CLASS B PLAN PROBLEM

Chapter XVIII

ENTOURAGE

WE HAVE spoken of mosaic as something entirely within the plan. Of course a presented drawing must show the relation between the building, or group of buildings, and the site on which it stands; and if this site is a sloping one, requiring terraces and stairs, or is in a garden or park, the portion of the plan outside the walls of the building is frequently of as much importance and requires as much study as that within. In Figure 178, a plan of the Villa Pia in the Vatican Gardens at Rome, the small court is the heart of the composition, the rooms in the casino are relatively of minor importance.

Even in such a plan as that which won the Grand Prix de Rome in 1913, Figure 181, though the rooms of this "Presidential Mansion in the Capital of a Large Republic" are large, ornate, and in imposing suites, it is easily seen of how much importance is the garden setting. The arrangement of this setting, the disposition of the site in relation to the buildings, is called the "entourage." This term is also used for the settings, the surroundings, of an elevation, of which we shall speak later.

Here again we have the same problem of a composition of fields and bands of grays, blacks and whites, with accents of spots and points. As in the case of mosaic, *success depends upon getting an "effect."* The average student leaves all question of entourage until the last days of a problem, often until after the drawings have reached the final paper, and then tries to jumble something together to make a presentation, and frequently finds that the building he has designed fits very awkwardly on the given site. This is quite unsatisfactory. The entourage, like the mosaic, must be studied from the start, and carried along with the study of the building, the big masses of the composition merely indicated on early studies and actual drawing left until toward the end. The effect may easily be studied by making rapid studies on tracing paper with charcoal and chalk. The entourage must help to explain the student's solution of the problem; the "big idea" must be kept in mind.

It is well to remember that while your problem calls for plan, section, elevation, of a composition (whether building, arrangement of garden elements or what not) in *three dimensions,* these drawings are presented *in two dimensions.* They are flat, and, to look well, to have a satisfactory psychological effect on the jury, these drawings, as drawings, must be *composed in two dimensions.* It is for this reason that the study of entourage is of great importance.

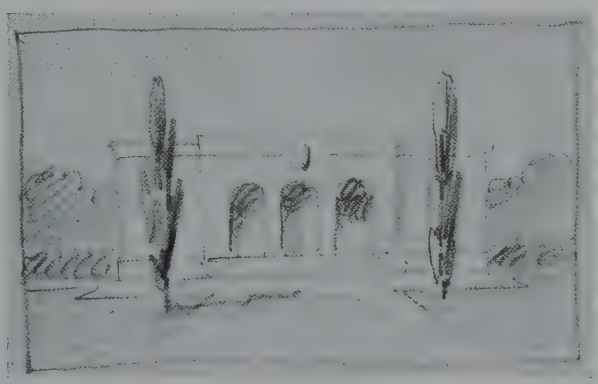

Figure 179.

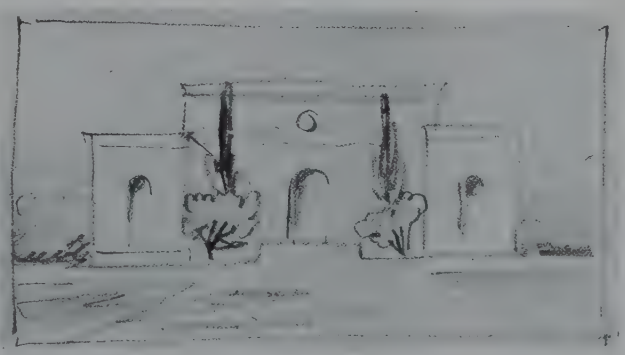

Figure 180.

Now the drawing of this entourage puzzles many students. They ask, for instance, the meaning of all the lines in the foreground of such a plan as that shown in Figure 181, and when told that the bands of gray may represent plots of grass, or hedges, or lines of clipped trees, flowerbeds, balustrades – that in some cases, in such a plan, almost any of these names might be applied to a given band or field – they are still more mystified.

But if we turn now to an air-plane photograph, the matter will be much clearer. Figure 183 is such a view of Versailles, and taken

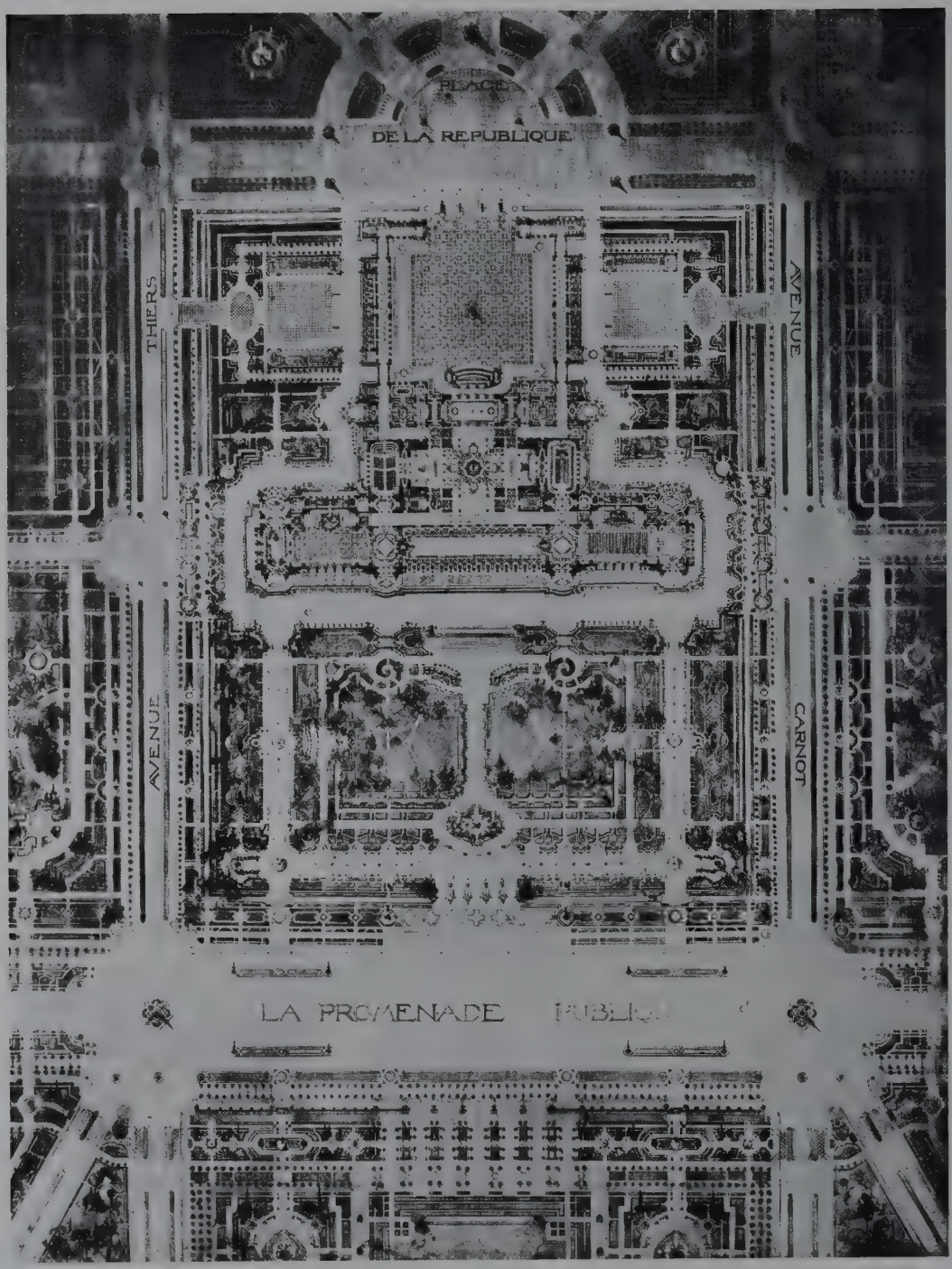

Figure 181. "Un Palais de la Présidence dans la Capitale d'une Grande République." M. Roger Séassal, Pupil of M. Héraud, Grand Prix de Rome, 1912-13, Ecole des Beaux Arts, Paris.

at sufficient height to be almost a plan. Compare this with the plan of Figure 181. We find the same fields and bands of white, black and gray, and the same points and spots used as accents. Even looking at the foreground of the air-plane view, we could not say definitely if a particular band were grass, or a hedge—or if another were a path, a step or a balustrade. The fact is, it does not matter. If just a portion of the garden were the subject of the program, then of course these details would be of importance and the study would be at larger scale; we should have a "close-up" to borrow a term from the moving pictures. But when these details are only a part of a setting off of a larger problem, they are *relatively* unimportant, and their success in forming a setting for the parti is the first consideration, not the exact meaning of a small detail.

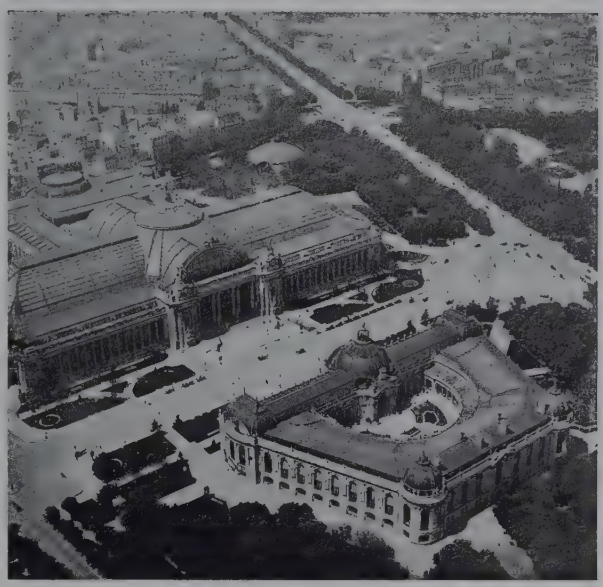

Figure 182. The "Grand" and the "Petit" Palace, Paris. From "Paris Vu en Ballon".

Air-plane photographs have been common since the war. Many of the important buildings of our country and of Europe have been so shown in recent newspapers and magazines. They are not only good documents for the study of plan, especially of entourage, they are also excellent aids in rendering. In the view of Versailles, and also in that of the Grand and Petit Palais at Paris, Figure 182, note the difference in value of the grass and of the trees; between pavement, almost white, and street, a perceptible gray; note in Figure 182 how the curb is given a shadow on one side of the street (as is frequently done in rendering by a ruling-pen shadow—see Figure 197), and also how snap and life are given by the shadows cast by trees, lamp-posts, etc.

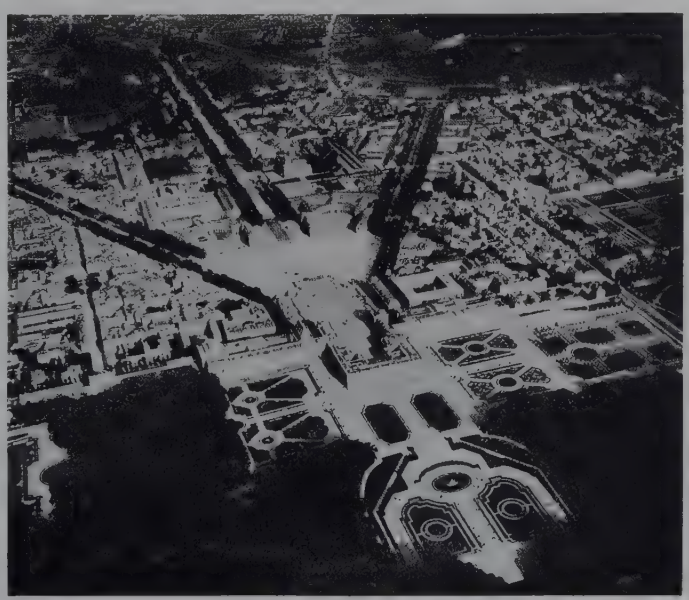

Figure 183. Versailles. From "Paris Vu en Ballon".

The plan of Figure 181 is, of course, a tremendous thing. Many small portions of it, about an inch square, would make a fair-sized Class B plan problem; for instance, the small music pavilion, and the small garden theatre, and the cascade—all on the horizontal axis through the center of the large garden.

It is because such a plan does have so many Class B plans within it, and also because the study of architecture will ultimately lead to such big compositions, that they may be of use as documents at this time, if one will only keep in mind the true scale of such a plan and its relation to the scale of plan on which one is working.

In Figure 106 we see in the plan for a State Historical Society a successful handling of the question of entourage for a small building; Figure 126 is also a simple and direct treatment, though quite formal in its lines.

Even where a building occupies most of the lot, the arrangement of what is left should be carefully studied. Figure 184 is such a plan—there is only a small strip of ground left at the sides: in this case, this is well handled. The treatment in Figure 109 of the plan of the small art museum is also happy: it is in such a case, where the building takes up almost all the lot.

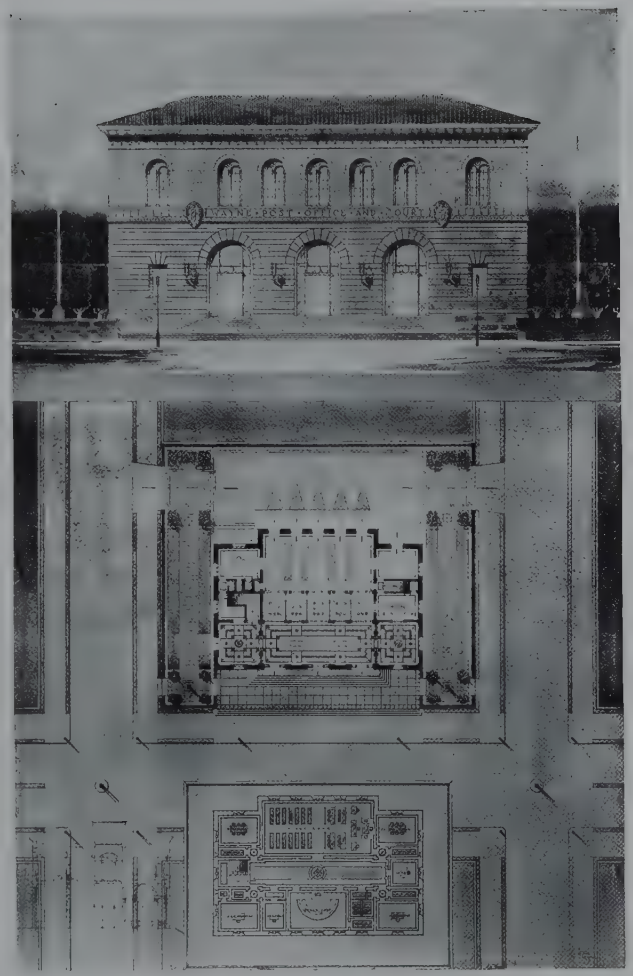

Figure 184. Class B Projet, "A Federal Building for a Small Town." P. N. Jenson, Atelier Wynkoop.

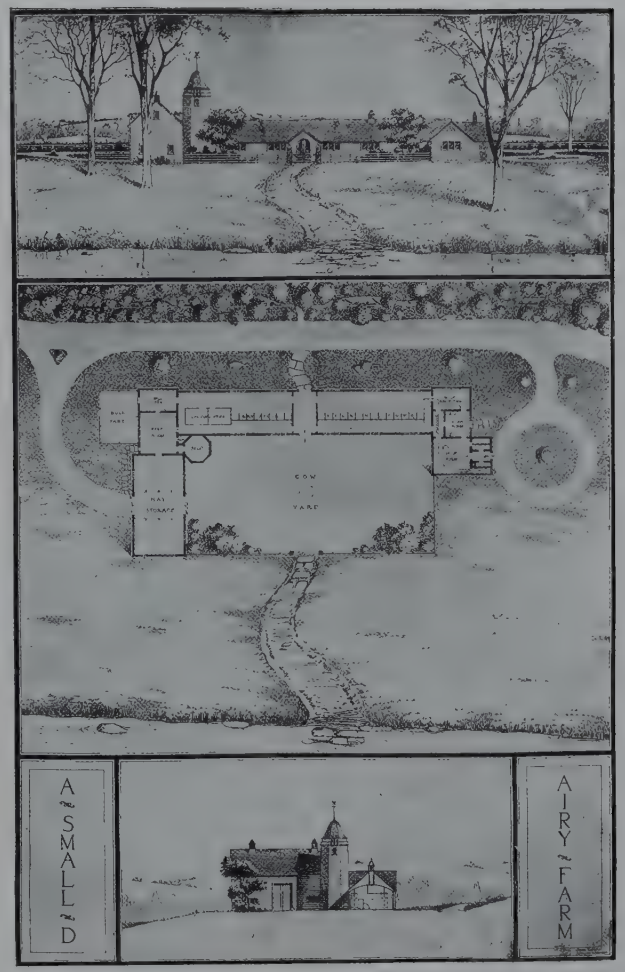

Figure 185. Class B Projet, "A Small Dairy Farm." John Regan, Atelier Wynkoop.

leaving unsymmetrical spaces here and there, that one realizes the value of giving a thought to the entourage early in the study of a problem.

But the entourage is not necessarily formal; Figure 105 shows a particularly satisfactory arrangement of formal lines, but very simple in detail, befitting the subject of the program. An extreme example of simplicity of entourage is shown in Figure 185 where in the plan for "A Small Dairy Farm" the rectangular cow yard ties the buildings together, and a road parallels the long axis of the group, and, and this is worth noting, the entourage is well drawn and well rendered. This extremely simple plan, quite appropriate to the program, would seem ugly if poorly presented, even granted it would look well built. The texture given to the grass just above and at the sides of the buildings is of more use than one would at first suppose. Figure 127 is another sort of simplicity—a utilitarian variety.

Simplicity depends after all on the character and scale of the problem. From this point of view, in a plan a hedge or a stone wall may be represented by one line, or by two lines, or three, or four lines or more, depending on the effect necessary. Any of these could represent a possible stone wall, or hedge. The important thing is to express scale and get an effect.

There is also the question of entourage in elevation. This being more pictorial, less conventionalized, is more generally understood, but a study, or several studies, should be made on tracing paper, placed over the elevation, with charcoal and chalk, or with a very soft pencil. One should not forget, however, that the elevation itself is a conventional drawing and that the arrangement of setting should not be too naturalistic, for that reason, except for small structures, or garden buildings, as in the spring house of Figure 103, and then *only if well done*. A real study has to be made of the setting of trees and foregrounds. It cannot be done at the last moment, and it should not be "too clever." If a drawing has such an appearance, the involuntary reaction of a jury is immediately to hunt for flaws, and if they are found, the penalty is the more severe because time has been spent on "cleverness" that was needed in further study of the architecture.

One hint may be of value. If the lines of a building are stiff, and the program is not one requiring formality in character, it is sometimes well to break these lines, in presentation, by means of some planting, as in Figures 179 and 180, or by a shadow on the foreground, shown fore-shortened.

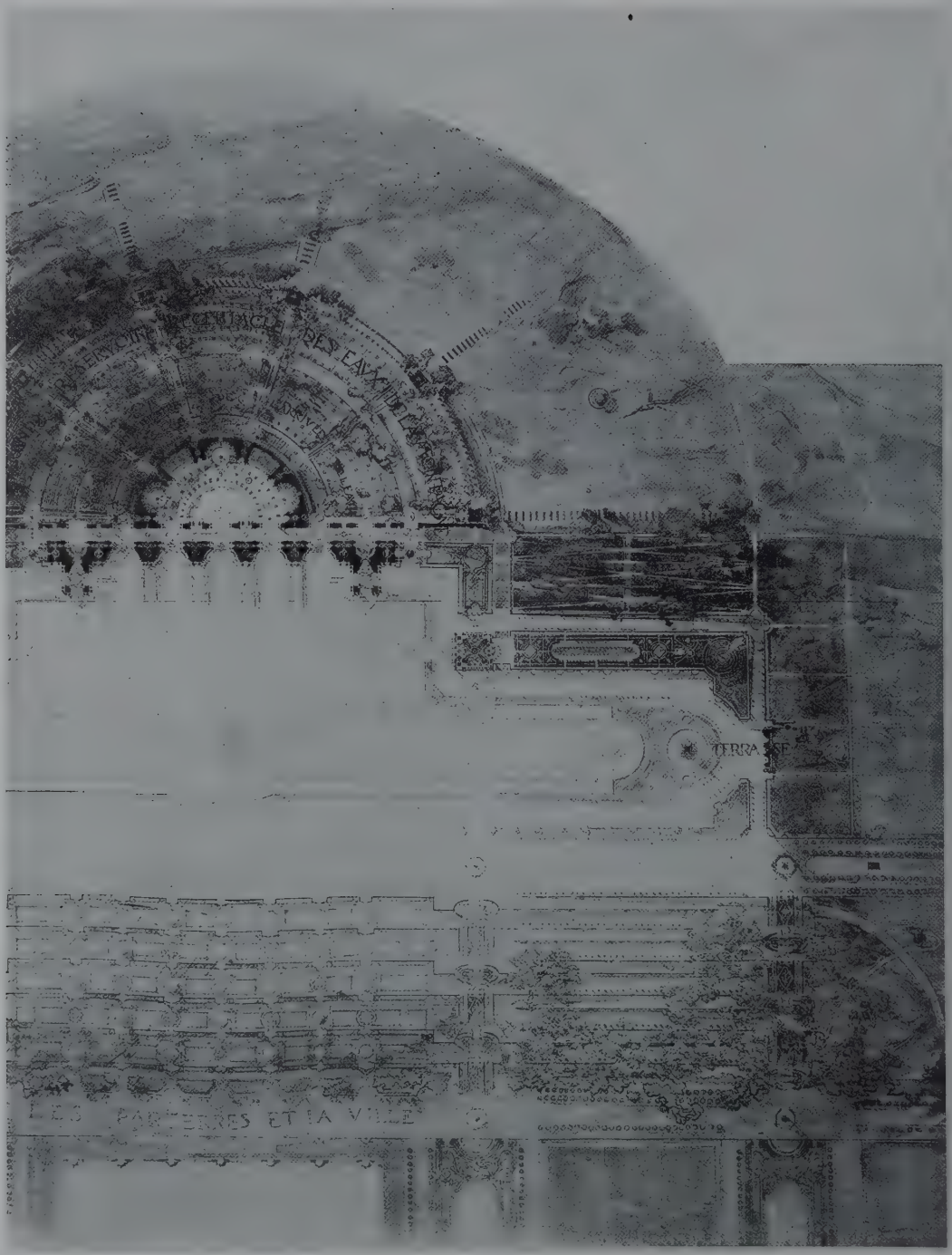

Figure 186. "Un Château d'Eau." Portion of Design by M. Janin, Pupil of M. Laloux. Placed Second, Grand Prix de Rome, Ecole des Beaux Arts, Paris.

THE CLASS B PLAN PROBLEM

Chapter XIX

INDICATION

AS ARCHITECTS understand it, "indication" may be of three kinds, in each of which the object is to get an "effect"; part of this desired effect is to give an idea of the third dimension as well as the floor area, for instance making thicker the points of poché that support big rooms, as we shall see later. These three kinds are (a) that used in making the esquisse; (b) that used in making studies, for one's own use or to present to the critic; and (c) that used in presentation drawings. Indication as used in the drawing of an "esquisse-esquisse," or sketch problem, is a mixture of the last two. It will be considered separately.

(a) In an esquisse a scheme is to be shown, but an indication of detail of any sort is avoided by preference, so that all such questions of detail may be left for study. Thus, in Figure 188, while the big divisions of the building are shown both in plan and elevation, there is no attempt, for instance, either in plan or elevation, to fix the number of windows in the wall which forms one of these divisions: even the number of columns in the portico is preferably left to the time when that number may be studied; the crowning feature of the end motive is purposely vague: there will be a mass there that will show in silhouette—that is all that it is desirable to indicate. There is a certain freedom in the drawing of an esquisse: it is not the place to express with definiteness.

Figure 187. An Example of the Kind of Indication Used in Making a Study.

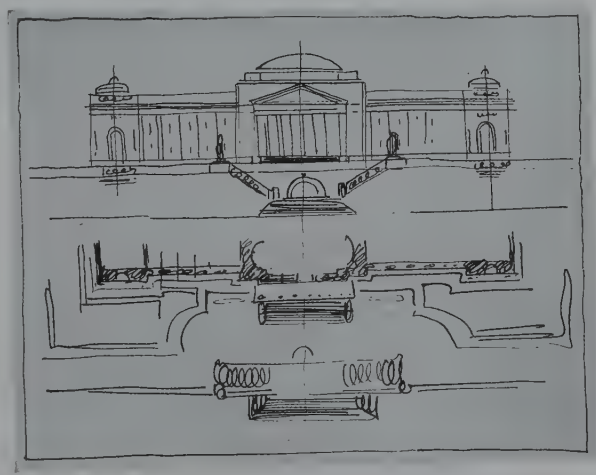

Figure 188.
Example of Indication Used in Making an Esquisse.

(b) In making studies it is needless to say that "indication" is a great time saver. Were time of no value studies might be made by means of carefully drawn and rendered plans and elevations, but where a limited time is given for a problem, (and to prepare for actual practice, where time has a money value) the principal use of indication is to make visible the "scheme" as rapidly as possible, and to confine one's attention to the big principles of design as effecting this scheme, and keep it away from detail. M. Scellier de Gisors, formerly a professor at the Ecole des Beaux Arts in Paris, preferred that all studies of elevation put before him early in the study of a problem should have all the openings—doors and windows—blacked in solid with ink, which of course would show immediately the proportion between the solids and the voids of a façade, as well as the proportion between the different voids; and these are the first things that must be studied and made satisfactory. He felt that a clever man, one who renders well, frequently deceives himself by making studies in which he has, because he can render well, covered up the faults in his design or taken the attention away from them.

It is for the same reason that most critics ask to be shown in the first few days of study of a problem, and at intervals during this study, a plan on which all the walls are pochéd — blacked in in ink—preferably, to save time, done

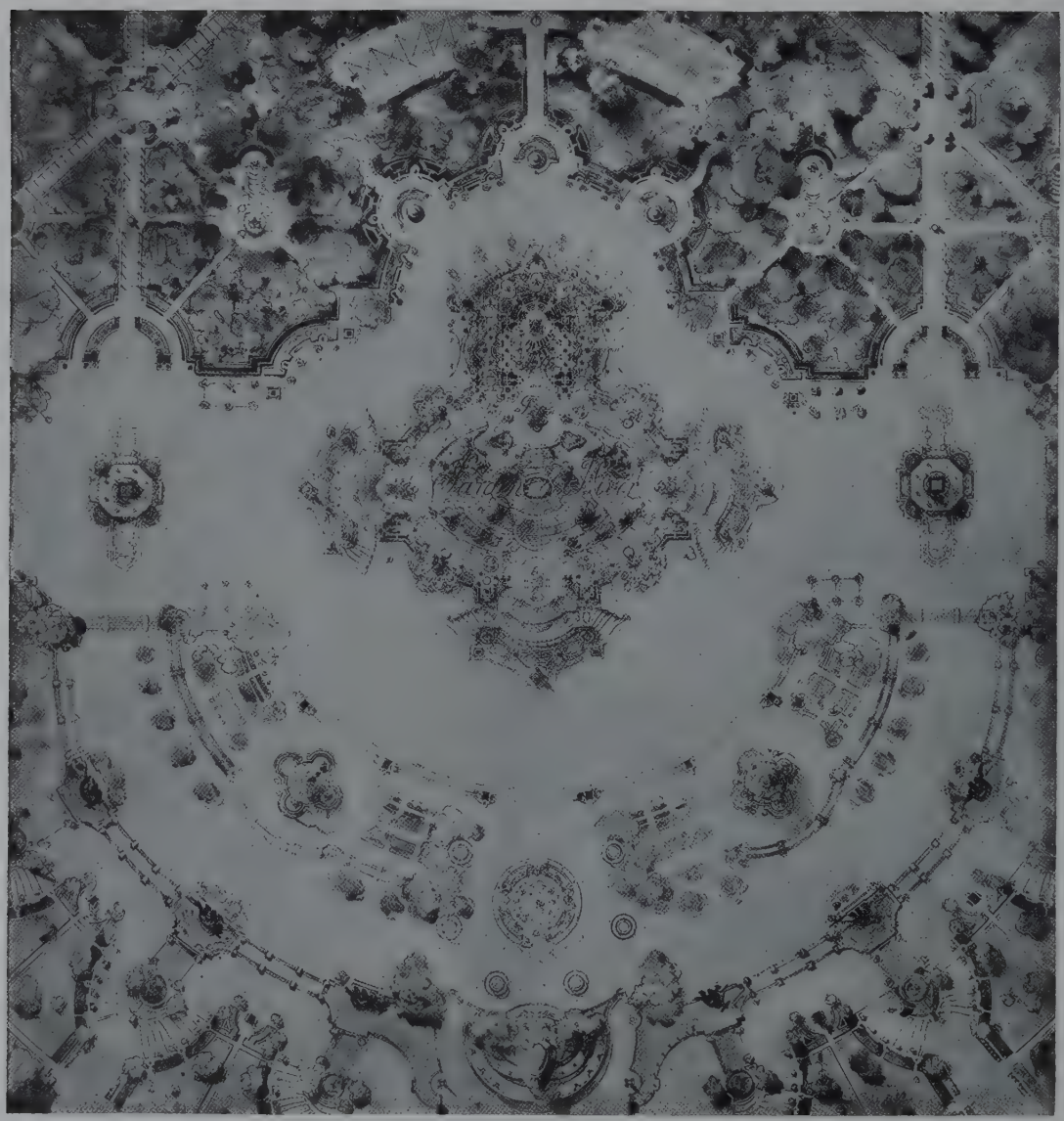

Figure 189. "Les Salles des Fétes et de Réunion et Les Grandes Serres d'un Jardin d'Acclimatation." Design by M. Maxime Petit, Pupil of M. Deglane for Achille Leclère Prize, 1912. Ecole des Beaux Arts, Paris.

free-hand with a brush or a stub pen. This will at once show the varying sizes of the rooms, their relation to each other, and which ones are important.

As the studies progress the indication enters more into detail. In free-hand studies of elevation, or studies in which the main lines, the part already determined from previous drawings, are made with T-square and triangle, other parts are done free-hand and largely "indicated." In any study of elevation shadows play an important part: the line of shadow having been cast, the shadow can be most quickly filled in by a vertical free-hand hatching-in in pencil or by a series of spirals, as in Figure 187, usually smudged with the finger in either case to make this hatching-in count as a mass rather than as lines. Openings are merely blacked-in until some arrangement of glass divisions and muntin bars worthy of more careful study is decided upon. Such details as balusters, column caps, or ornament, are indicated rather than drawn.

Indication in plan is important for use in study for the same reason *–to avoid spending time on detail that should be spent in study of proportion.* Compare Figures 170 and 171. As we have already said, the former gives very well the general effect, yet a comparison of the two immediately shows the difference in time required to get this effect.

(c) Even in the presentation drawings, when an elevation is at small scale, the ornament on mouldings is frequently indicated and not drawn. Unless a drawing is large enough in size to study such detail it makes little difference whether the ornament be egg and dart or tongue and leaf, or something else—a band of gray is the important thing. Bas-reliefs or sculpture may frequently be indicated rather than drawn on such small scale elevations.

Indication is of more importance in the plan than in the elevation, because the plan is a conventional drawing, and indication plays a large part in this convention. Indication affects both the "poché"—the actual walls of the building—and the "mosaic," both inside and outside of these walls. Let us take first the poché. As we have said, the poché shows which rooms are important: the big rooms will usually have thicker walls—thicker points of poché—because the great spans required to roof them will cause heavy loads on these walls, hence the walls must be thick enough to furnish an adequate support. These rooms too will usually have a richer outline—as the walls may have pilasters, engaged columns, panels, or niches, which would be lacking in corridors or rooms intended for the minor services of the building. Thus the poché will at once give scale and character to a plan.

It is interesting to study the Grand Prix plan of Bigot, Figure 191, to see how the character in the three portions of the group—bathhouse, casino, ball-room—is indicated by both poché and mosaic. In the central one of the three buildings—the "casino" proper—is a large hall containing medicinal springs; this is a large room without intermediate supports between the walls, and the walls are everywhere penetrated by openings, hence at the places where some wall does exist the poché is made very thick, to take the concentrated weight. Surrounding this room are rooms which are smaller and lower, and the poché is, consequently, much lighter. The indication throughout this central building is gay, with columns and niches used as wall ornament: the bath building at the left, intended for bathing in the medicinal waters—for the use of the ailing, in fact—and not having any rooms for the gathering together of people for social purposes, is, by contrast, quite plain in its indication.

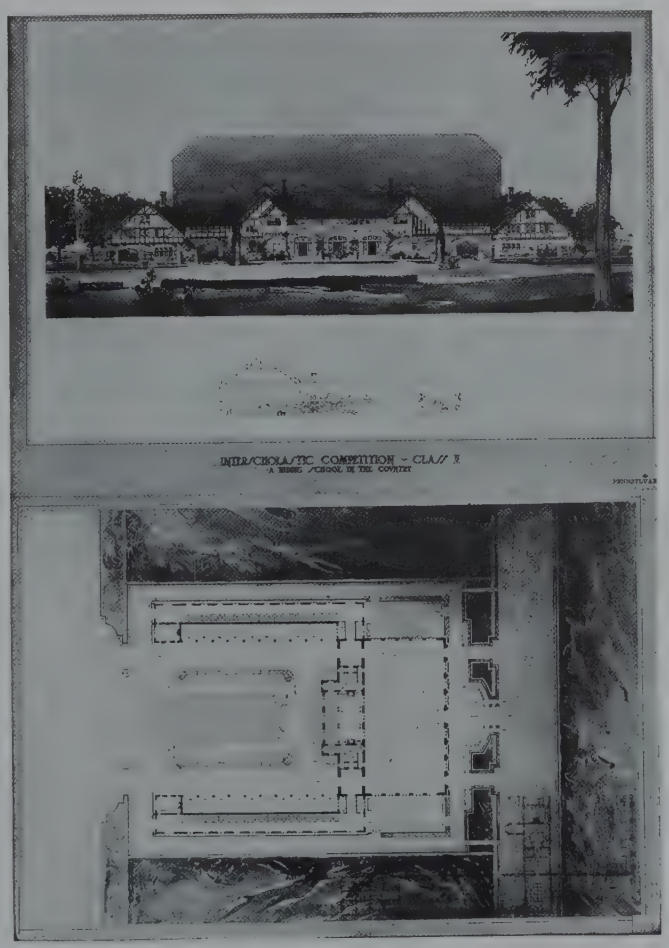

Figure 190. "A Riding School in the Country," by G. E. Brumbaugh, University of Pennsylvania. Honorable Mention in Class B, Interscholastic Competition 1911-12.

In examining any plan we see that the walls vary in size—in a big plan, that the exterior walls are, in general heavier than interior walls, and that there is a great variation in interior walls; as before mentioned the big rooms require heavy poché no matter where located,—the bigger the room the heavier the poché.

To really give scale to poché the student should study plans of executed work, measuring the thickness of construction and dimensions of materials, especially in documents of antique, Gothic, and Renaissance work, for it is on these that our tradition of design is founded. Modern work, with its steel construction, is apt to make use of very thin walls unless the rooms are studied in section, in which case the walls are furred out to give the reveals our tradition requires. One reason why so much modern work seems "thin" in appearance, and unpleasing as compared to the sturdy building of earlier times is that engineers have become proficient in working out, mathematically, the stresses of various materials, and in computing the loads put upon them. Architects able to make use of these calculations, and faced with the high costs of present day building, naturally make their walls and points of support only as thick as may be needed to carry the imposed loads and thrusts. The builders of earlier times were not able to make such calculations, and made walls thick enough to reassure the eye as to their strength to withstand whatever strains were put upon them.

The indication of the mosaic—and the drawing of the entourage—in the presentation should show the same characteristics as already exist in the poché. Usually the poché is in black ink, both the outline drawn with the ruling pen, and the surface between. All the other lines of the plan are drawn with a diluted ink, and should be sufficiently dark so that they will not be lost in the first washes of the rendering after being rubbed (to remove pencil lines and dirt) in preparing the drawing for rendering—and yet not so dark as to conflict with the poché. Ink that is only slightly diluted with water, however, becomes very much lighter with even a small amount of rubbing or sponging, so ink may be used which seems quite dark while drawing. The undiluted ink does not materially lighten with sponging or under

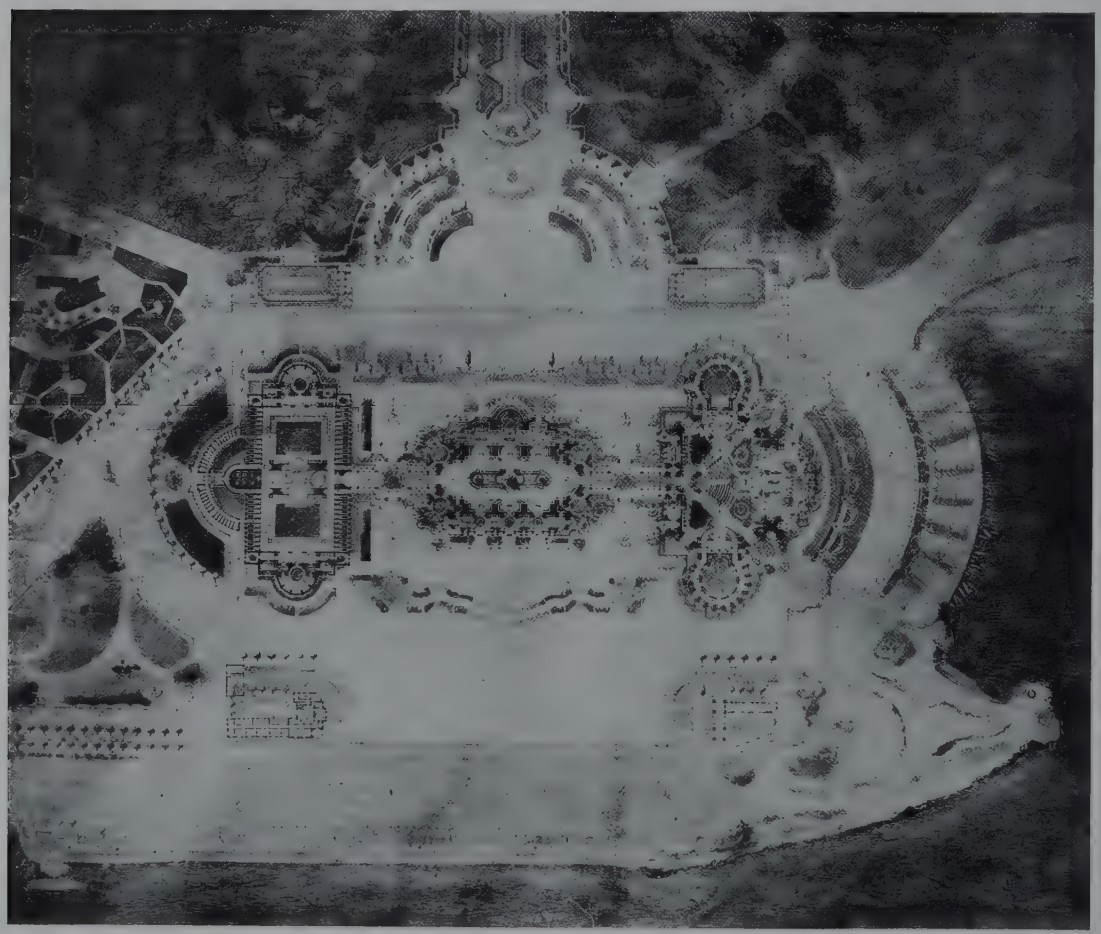

Figure 191. "Un Etablissement d'Eaux Thermales et Casino," by Paul Bigot, Pupil of M. Laloux. Grand Prix, 1900. Ecole des Beaux Arts, Paris.

the cleaning rubber. Just outside the poché, whether inside or outside of the building, it is well to put a "snap-line"; none of the lines of the mosaic should cross this snap-line, and washes in rendering, other than the general all-over washes, should stop against it.

Figure 190 is a good example of a very simple presentation of a B Class problem—one submitted in the inter-scholastic competition of 1911-12—"A Riding School in the Country." It is interesting to see how well the forecourt looks, drawn with so very few lines. Figure 186, a portion of the Grand Prix competition plan of M. Janin for "Un Château d'Eau", while very different in scale, shows in the same way how well the presentation of a plan may be studied, and how few lines are necessary if they are in the right place. This plan would give many ideas for the treatment of entourage. We speak of Figure 190 having few lines for a class B problem, Figure 186 having few lines for a projet on a much larger scale. Of course the term "few" is a relative one, and there are many lines in these plans, especially in Janin's Grand Prix. But these lines are grouped together, and there are sizable areas left without drawing of any kind. Where to put lines, and where to leave them out, is largely a question of composition—of the plan considered as a "picture", or composition in two dimensions, it being understood, of course, that the poché has already been studied to a satisfactory conclusion in considering the building as itself a composition in three dimensions. In any plan there are always these two objectives: the building must be conceived in three dimensions, and studied so that it will be satisfying as such, seen from any possible position from within or without; and the plan must be presented as a compelling composition in two dimensions, so composed as to have the psychological effect on the beholder of seeming adequate and pleasing.

Tauzin's plan for "A College of France", Figure 192, is interesting because of its simplicity of indication. Most of the premiated work of the Ecole des Beaux Arts is worthy of study from the standpoint of indication. They are all expressions of a well-formed tradition which has been built up gradually through the many years of the school's existence.

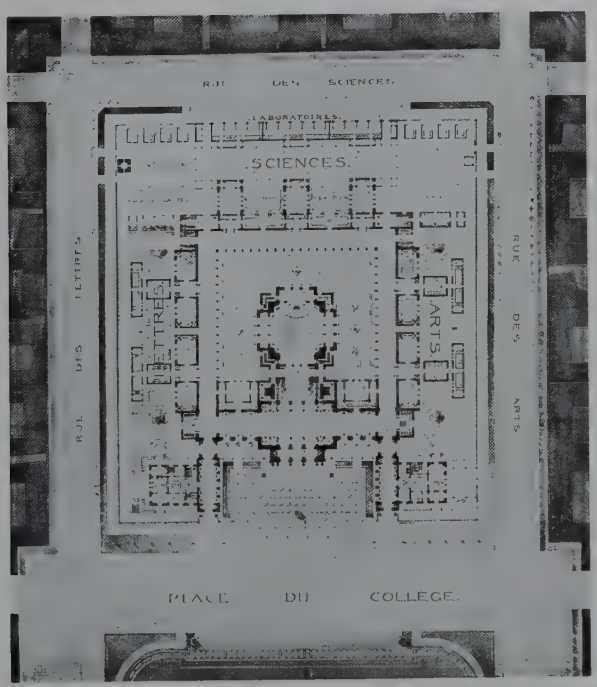

Figure 192. Plan of "A College of France," by M. Tauzin (1er Second Grand Prix, 1904.)

Figure 193. St. Peter's, Rome.

Figure 194. Chamber of Deputies, Paris.

THE CLASS B PLAN PROBLEM

Chapter XX

RENDERING

IN RENDERING the analytique a "monotone" is required; for the class "B" plan problems there is no such stipulation, so a color rendering is permissible. For many of the problems a monotone rendering is most suitable—for a formal problem in which the scale of the plan and elevation leaves little of the area of the mount for setting,—but for others, such as "A Small Dairy Farm" of Figure 185, or "A Spring House" of Figure 103, or "A Private Art Museum" of Figure 126, a rendering in color may be more appropriate—more suitable to the character of the program.

There is another reason for doing some of one's class "B" rendering in color, and that is to prepare for later work—for archæology projets, for class "A" work, especially for the decorative problems, and for the prize problems and sketch problems. For these one has to learn how to handle color ultimately, so it is well to begin early, for in this, as in many other things, experience and practice are the best teachers. It is better to spoil a class "B" problem to learn something about rendering color than to make a *first trial* of color on a well studied class "A" problem, if that is the alternative. If one has a few examples of good renderings about, if not originals then reproductions in color of some color renderings (there have been many such published, in the magazines and catalogues of exhibitions), his first attempt need not be a failure, especially if the student can see where his rendering is not a great success and with a sponge and water sop out these parts and work over them again.

I need hardly say that a good rendering—whether in monotone or color—requires time, the first rendering with a new medium especially; for most men a color rendering requires more time than one in monotone for obvious reasons. The schedule disposing of the time given for a problem, as outlined in Chapter II, on the "Analytique," and again referred to in the early chapters of the class "B" plan problem, should be made out with this in mind, allowing the rendering of at least one drawing–the one in which rendering plays the biggest part in the presentation—to be started a full week before the date the problem is due. This is usually the elevation, but may be the plan. If this drawing is ready for rendering, inked in, cleaned down and shadows cast, on the Saturday afternoon a week before the date of "rendu," then that afternoon and the Sunday and the succeeding Saturday afternoon and Sunday may be used,—all with daylight; and for a color rendering daylight is essential for good color effects, especially in regard to yellows of all kinds, or other colors mixed with yellows. The evenings of this week may be used for finishing the other drawings, ready for rendering, and for the mechanical portions of rendering, the ruling pen shadows, accents, back shadows, etc.

These remarks apply more especially to the atelier man, he who works in an office from nine to five and has no daylight for his atelier work except Saturday afternoon and Sunday. The man in a college or technical school is more fortunate in this matter. He can start to render his first drawing on the Thursday afternoon preceding the rendu and have ample time to make a good finish. In this, as in every other branch of the pursuit of knowledge, the knowledge comes largely with experience, from actual experience, and of course the man who habitually leaves but one day to render is not apt to become proficient. He doesn't do enough rendering to learn how to render.

We must always keep in mind that the main purpose of architectural rendering is not to make a pretty picture, but to make a conventional drawing intelligible, to interpret it. When rendering is applied to geometrical drawings (i. e., plans, sections, elevations) it must partake of the conventionality of these drawings.

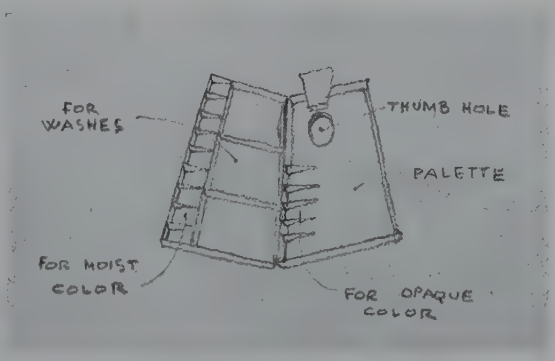

Figure 195. Water Color Box.

As we have said before, the first condition of a good rendering is that it be applied to a good drawing. This means not only the elevation (or plan) itself must be well drawn, but the entourage as well. In general, geometrical drawings do not require a great deal in the way of accessories or surroundings, and if the trees, mountains,

and perspective foregrounds are not *studied and carefully drawn*, it would be better to have a simple graded wash. When trees, etc., are used they should be drawn nearly geometrically, so as not to conflict with the lines of the façade and they must be drawn carefully, studied first in charcoal to get an idea of their value in relation to the façade, then drawn on the final drawing with the same care as the architectural features, but left in pencil—not inked in.

Shadows must be neatly drawn and appear accurate. In many small scale drawings the main shadows are approximately correct but the small ones are unfortunately grossly exaggerated, so that the projections tend to a dull uniformity, when all refinement in mouldings is based on a variety in projection. With the drawing finished, and shadows cast, we are now ready for the rendering proper.

Figure 196. Graded Washes of Water Color.

First as to pigments: (see footnote 1.) there are many colors manufactured. Of these some are very beautiful, but fade in time or re-act chemically when mixed with other pigments, causing a change in color. The following list of pigments gives a palette that will cover all needs, and is made of lasting colors:

YELLOWS: Lemon Yellow (greenish yellow), *Aureolin (pure yellow). Successively redder yellows: *Indian Yellow, Cadmium Yellow (pale), Naples Yellow, Yellow Ochre, *Raw Sienna.

REDS: Successively less yellow: *Burnt Sienna, Indian Red, *Light Red, Vermilion. *Alizarin Crimson (red), Pink Madder (red), *Brown Madder (bluish red).

BLUES: *French Blue (reddish blue), New Blue, *Cobalt Blue (pure blue), Prussian Blue (greenish blue), Cerulean Blue.

Emerald Green, *Ivory Black, *Chinese White.

It will be noted that these colors are arranged in color sequence, and they may be so arranged in the color box so that one comes in time to run instinctively along the line of colors until reaching the exact tint needed in a mixture. This is quite a complete palette; one can get along entirely satisfactorily in rendering with those of the list marked with an asterisk, for from the pigments so marked any color can be mixed if one knows his pigments.

The box best suited for the architect's work, rendering and outdoor sketching, is a French box made by Chapron Coquelin, 2. in Paris, and shown in Figure 195. I consider this box the best because the colors are bought and the reserve supply kept in tubes so that the colors are always soft and usable and the reserve does not "dry out"; the colors as squeezed out are in triangular compartments, so that the brush may get at the color from the end where there is no wall to wear it out; and also, these boxes are convenient to hold, having a hole for the thumb, are convenient to carry and convenient to use, with pans on one side for mixing small washes (for big ones saucers or glasses are used) and a palette on the other side for mixing accents and small tones. The two halves are hinged to fold on each other when not in use.

1—Note.—In this connection the student will find interesting the chapter on "The Properties of Pigments" in H. Van Buren Magonigle's "Architectural Rendering in Wash."

2—Chapron Coquelin, 34 Rue de Seine, Paris.

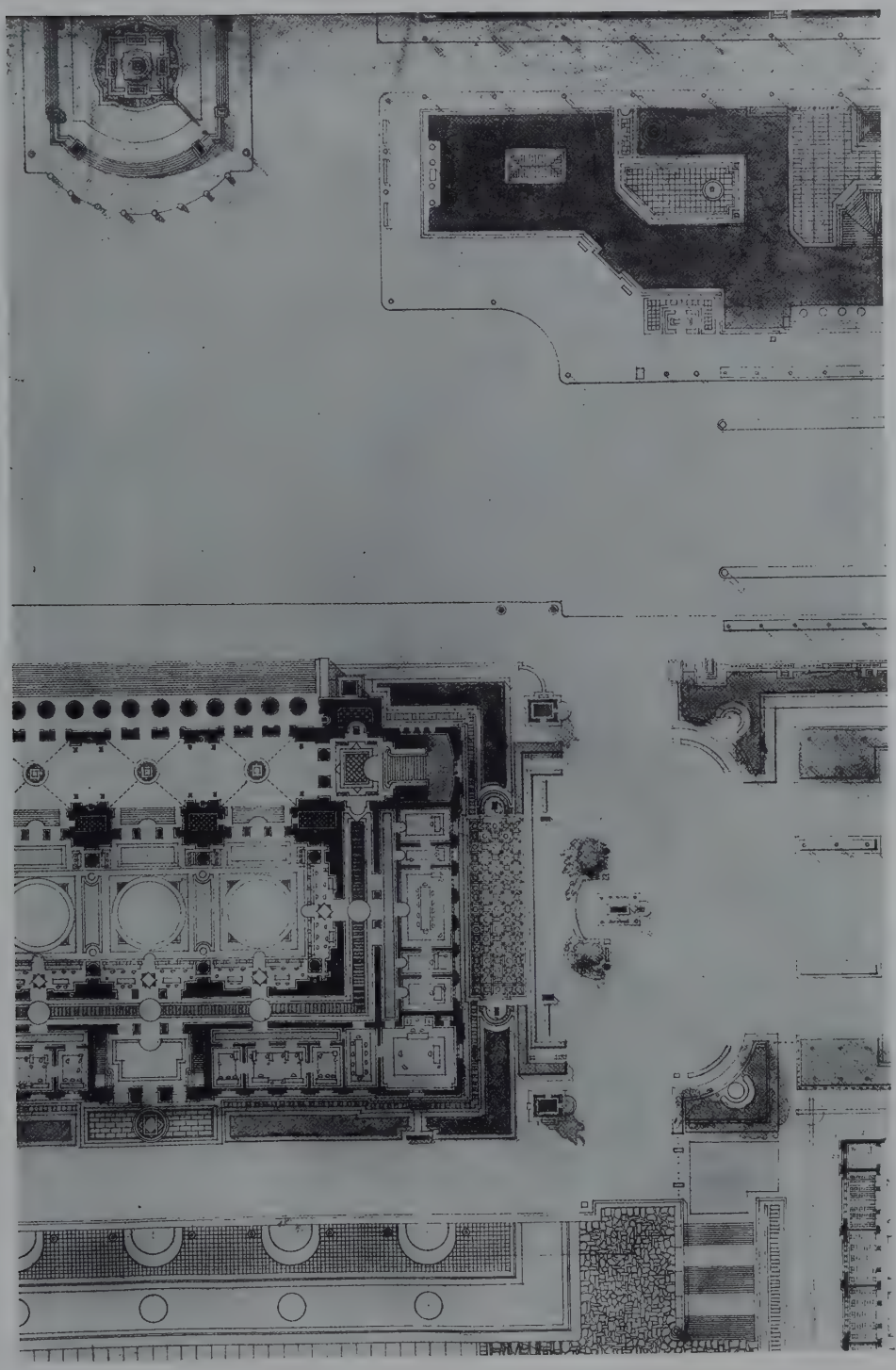

Figure 197. Portion of a Plan for a Custom House, by John F. Harbeson.

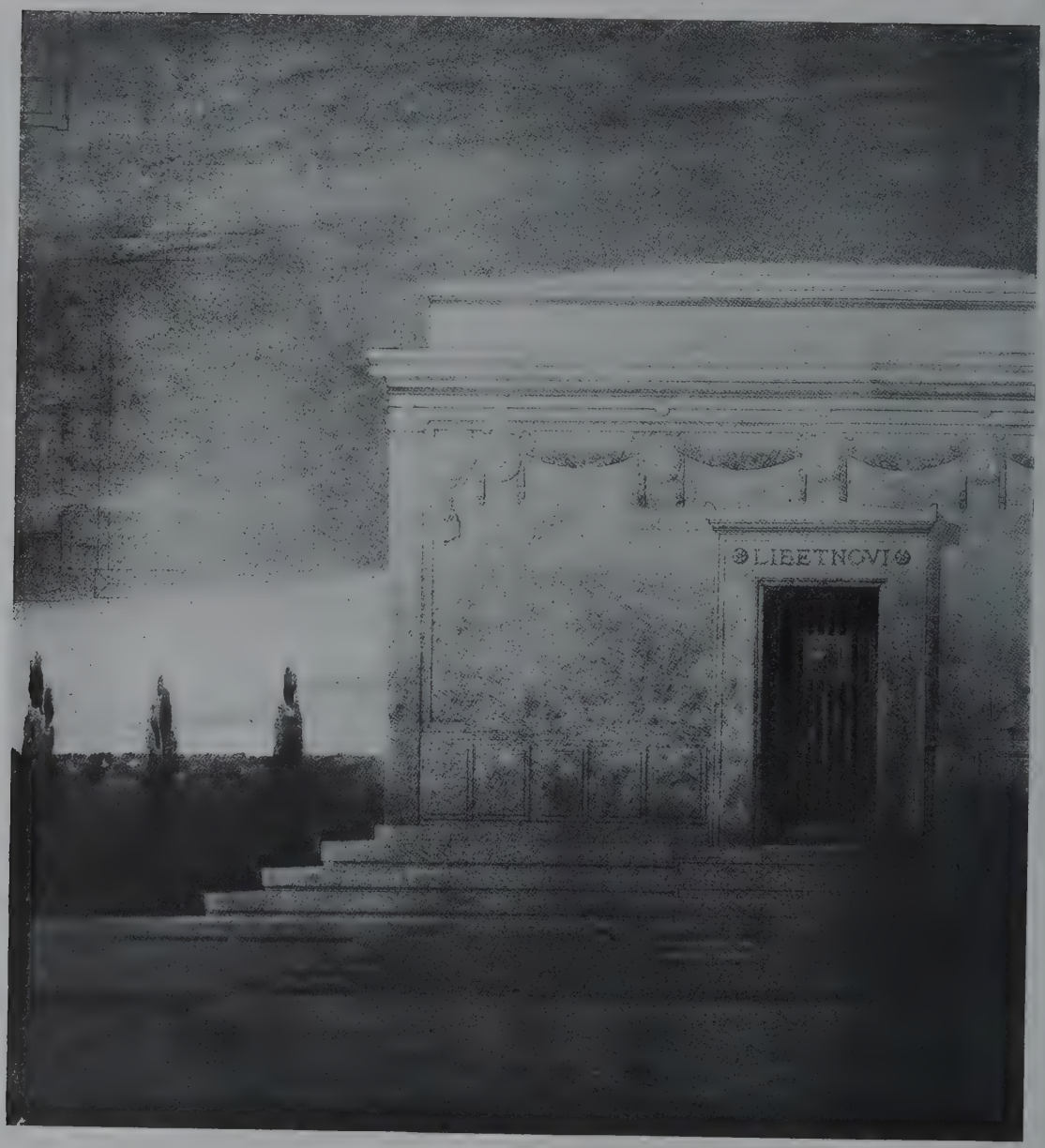

Figure 198. Portion of an Elevation by John F. Harbeson, Second Prize, Friends of Young Artists Competition, 1915.

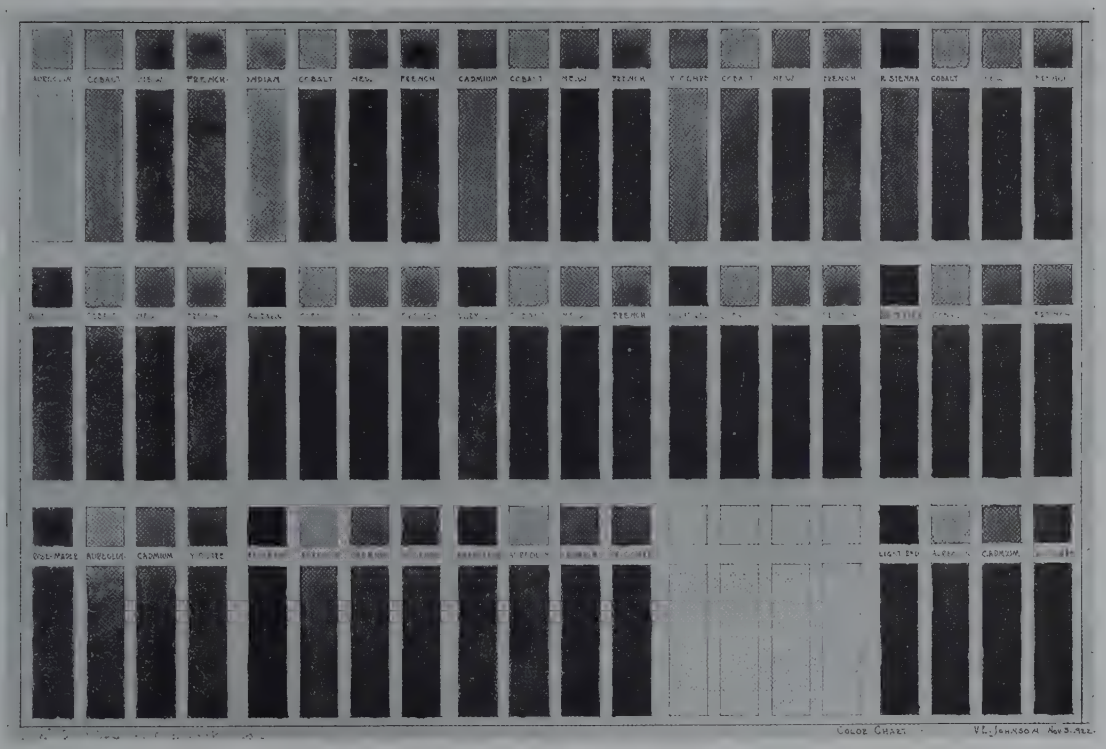

Figure 199. Superposed Washes of Water Color.

As there are not enough compartments on one side for all the colors in the palette suggested, it is convenient to put the more opaque colors—the colors with a heavy body—over in the compartments on the palette side, as they are seldom used in washes, most often in small tones or accents. Thus there would be placed on that side lemon, cadmium and Naples yellow, Indian red and vermilion, cerulean blue and emerald green. The ivory black need not be put in the box at all. A small bit may be squeezed on the palette when it is needed in rendering for it is never used for out-door sketching, and as Chinese white is quite useless when it has dried, it too, is left out of the box and kept in the tube, and a bit squeezed on the palette when needed.

Having these colors, it is well to get acquainted with them. This can best be done by taking a day or two between two problems and making two sheets of washes, the first as in Figure 196, laying off a number of rectangles and then running in each a wash of one of the pigments, graded from dark at the top down to light at the bottom, by adding more and more water, preferably in the sequence of the list of colors given above. In Figure 196 there are no washes of Prussian blue, cerulean blue or ivory black, but it would be well to include these on the sheet. After making such a sheet, compare it with the one reproduced in Figure 196 to realize how blues always photograph, and reproduce—much lighter than their true color, and yellows much blacker.

Then lay out another sheet as in Figure 199. In the first group of four squares and four rectangles lay a wash of aureolin; a heavy flat wash in the square, and in the rectangles a wash graded from dark at the top to light at the bottom. Leave the first square and rectangle in that way and over the second put washes of cobalt blue, over the third of new blue, over the fourth of French blue. In each case put a flat dark wash over the yellow in the square and in the rectangle a wash graded from dark at the top to light at the bottom. (In the figure only flat washes were used; graded washes are of much greater value, however.) In the second group of four squares and four rectangles put similar washes of Indian yellow, in the next group of four put washes of yellow ochre, and in the last, to the right, of raw Sienna. Now in each group, as in the first, run washes of cobalt, new and French blue successively, over each second, third and fourth square and rectangle. Then start on the second line with the reds, put washes of rose madder, alizarin, vermilion, light red, and brown madder and again put the superposed washes of cobalt, new and French blue. In the third line try the combination of reds and yellows, putting washes of the reds as before and then running washes of aureolin where the cobalt was run in the second line, cadmium in place of new blue, and yellow ochre in place of French blue.

In this way you will try the combination of your yellows, reds and blues; in all your work it will be

better to get the color you want by mixing two pigments, not more, and with this palette that can be done and you will very quickly get an idea of what tone any two colors will give when mixed in any proportion. In this way you will be able to avoid dun browns and "dead" colors.

With such a knowledge of color you may now try a color rendering and I would repeat what I said when speaking of rendering the analytique. (Chapters VII and VIII). (a) Proceed in an orderly process, carrying all parts of the drawing at the same stage of completion in successive steps. (b) Run all the big washes first and gradually work down through the smaller, though big washes may still be used from time to time to "pull the rendering together" if it is disjointed. (c) Keep neat edges to all washes. (d) Put a tone on each part of the drawing at the start, shadows, foregrounds, the various planes of the building, roof, sky; and do not expect to get the exact value or color in the first wash. (e) All washes, all tones, are best graded, whether shadows, planes of the building, roofs, foregrounds. (f) Model all rounded surfaces; remember to differentiate high light and half tones as well as shadows. (g) Focus the rendering at the principal plane; in the monotone rendering this was done by means of washes of varying depth, all of one color. In the color rendering, surfaces of the same color become more blue as they are further away (because of the action of the atmosphere) and are warmer in color as they are nearer; but in a color rendering, as in a monotone, the contrast between surfaces in light and the same surfaces in shadow, is greatest on the principal plane,—the plane of "focus,"—and this contrast becomes less marked as planes recede from or come forward of this plane. (h) Do not forget the "reflected" shadows (even in a small scale drawing) or the ruling pen shadows. See Figure 198. The use of ruling pen rendering and rendering by small tones in a color rendering in plan is shown in Figure 197. (i) Study effects as they occur in nature, on buildings and in the landscape. Study renderings, the actual renderings wherever possible, but also reproductions. Figure 200 is a very clever one; there are many even in student work worthy of study. And finally, *render* as much as you can; on your own problems—do the sketch problems—help the men doing the analytique, "nigger" for the class "A" men. Men who play football, baseball or chess, or a musical instrument, and play well, practice incessantly; the same is true of men who render well.

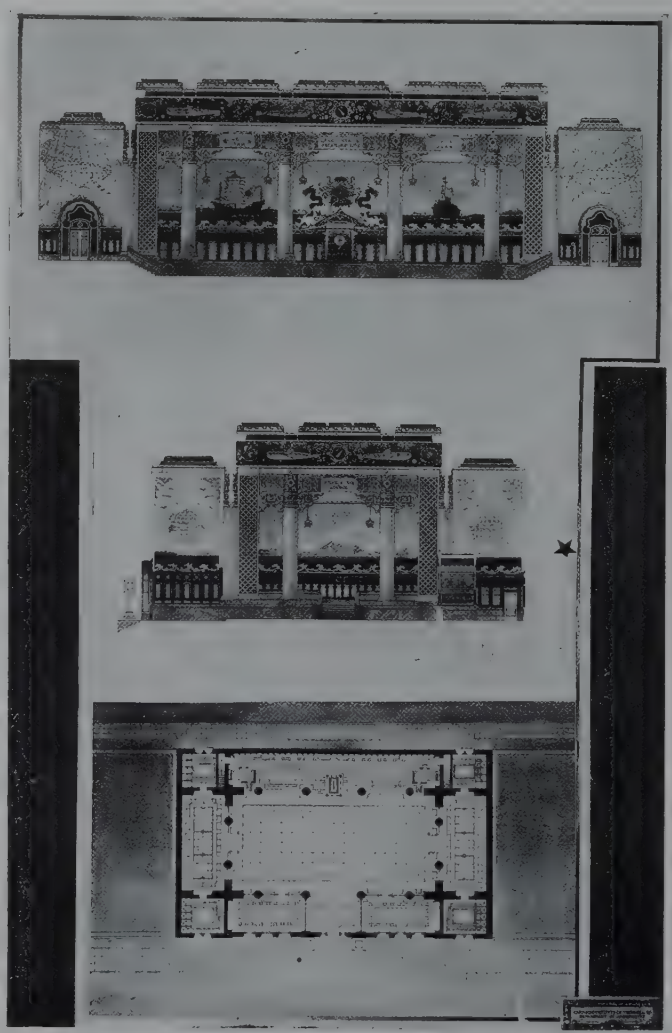

Figure 200.
Steamship Office, C. E. Silling, Carnegie Institute of Technology.

This concludes the chapters on "The Class B Plan Problem". We have said nothing about sketch problems as all remarks about them have been grouped in the chapters on "The Sketch Problem."

Every B class man should take the B class sketch problems of course, not only because that is the only way to learn how to do sketch problems (and *to get into the final competitions for the Paris Prize one must be able to do a good sketch problem*), but because the sketch problem frequently makes evident, in very striking ways, ideas that are of use in working on the plan problems.

The student should take every sketch problem while he is in class B (this means only one day's work for each sketch problem). We therefore suggest that he now read Chapter XXXII and Chapter XXXIII on "The Sketch Problem."

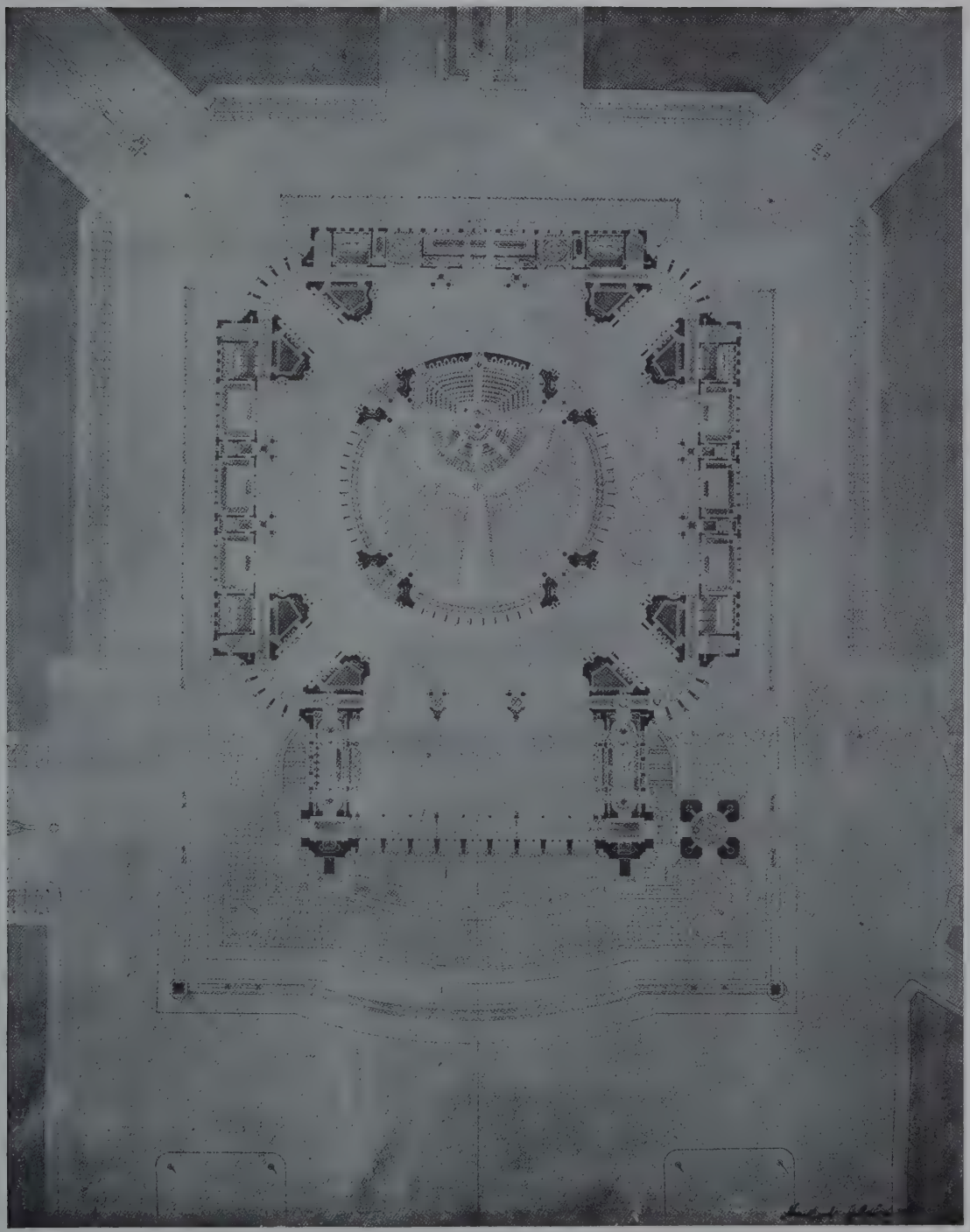

Figure 201. Design by Jean Hulot for "A National Convention Hall at New York," Projet, Ecole des Beaux Arts, Prix Américains. An interesting example in a "school plan" of the indication of steel construction in an immense building—this one was to seat 20,000 people.

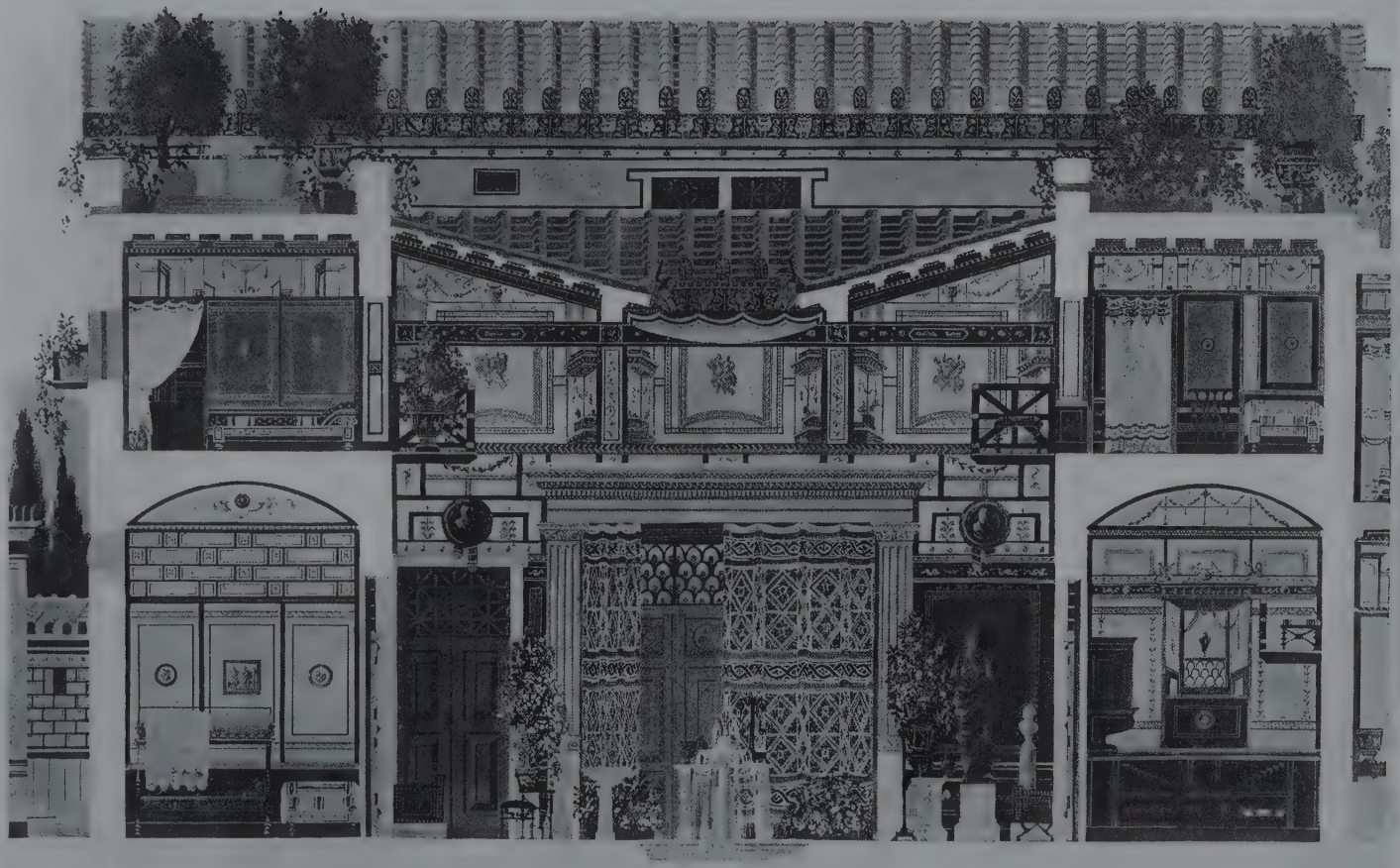

Figure 202. House at Pompeii, from H. D'Espouy's "Fragments D'Architecture Antique." An "Archæology" as well as a "Measured Drawing", as much of the work was conjectural "restoration", though based on measurements of existing remains.

THE ARCHAEOLOGY PROJET AND MEASURED DRAWINGS

Chapter XXI

THE ARCHAEOLOGY PROJET

MANY men take an "archæo" simply because a credit in archæology is required to get the certificate of the Beaux-Arts Institute, and yet if we look over the published work, the premiated work, we find some names that appear again and again under an "archæo," and the oftener we find the name, the more likelihood that the work gives evidence of ability and cleverness. These men have found that there is a great fascination in the archæology problems, an appeal quite different from that of the projet, different even from the "decorative problem," for here there is little thought of *parti* or scheme, even the ordinary laws of design—symmetry, balance, arrangement of voids to solids, etc.,—take a secondary place and there is great freedom for fancy, for picturesque effect; for imagination, in fact, unhampered by practical requirements. The *parti* is usually fixed by the program. At any rate, in an archæo a *parti must not be originated;* it, too, like the ornament and details, must be taken from documents of the style in question.

There are several good reasons for doing archæology problems. In the first place, if a man is working in an atelier at night only, and in an office by day, taking an archæo gives him a chance for a let-up from the hard grind of the regular projet, for the time given for the archæo is about twice as long as that given for the projet, and while all of this time can be used to advantage in studying the archæology, it is quite possible to do a very good archæo by using only a portion of it. It is thus possible to take one of these problems when one has not enough time to study properly a big plan problem.

Then, too, with this greater time and also because the archæo problem is not concerned with the finding or studying of a *parti* or scheme, there is always a very much greater proportion of time that can be used for the presentation than is the case with the plan projets. So these problems always offer the opportunity to try different kinds of rendering and to increase one's ability at rendering. Mediums may be used that would be frowned upon for a plan projet, opaque colors, lithograph effects; and drawing in perspective, which is seldom allowed for a plan projet, is here desired. The composition of the sheet is again of great importance, as usually details of the style are called for. When this is the case, if the small scale drawing is shown in elevation, as in Figure 206, a Spanish loggia, the problem of composition is very much what it was in the analytique, only the forms are more free and one begins to see that much of the "composing" may be done in the rendering: i.e., that washes and tones can be used to arrange a drawing. More often in an archæology, however, the small scale drawing is in perspective as in the "Normandy Shop Front," Figure 203. In this case the selection of the point of view plays an important part in the composition, as does the location of the source of light, with the resulting shadows, and the arrangement of architectural forms, gables, chimneys, dormers, etc., and accessories, people and animals, signs, etc. When no details are required, the entire problem of composi-

Figure 203. Archæology Projet, "A Normandy Shop Front," Clayton E. Jenkins.

Figure 204. Archæology Projet,
"Entrance to an Assyrian Palace," Paul Domville.

Figure 205. Archæology Projet,
"Entrance to an Assyrian Palace," J. D. Epps.

Figure 206. Archæology Projet, "A Spanish Renaissance Loggia," John F. Harbeson.

Figure 207. Archæology Projet, "A Studio in the Russian Style," Boris Riaboff.

Figure 208. Archæology Projet, "A House of the Fourteenth Century in France," John F. Harbeson.

tion is in the handling of this small scale drawing, selection of point of view, arrangement of light and shade, disposition of architectural features and accessories. Figure 208 is an example of this type of problem. When a student attempts this sort of thing he begins to realize the value of the training in composition in the "analytique." After an attempt of this character, he will find a book on composition, such as Van Pelt's, much more intelligible than before. I refer to the chapters on painter's composition—composition in two dimensions—and not to those referring to the composition of architectural forms, which is a study in three dimensions, always intelligible to the architectural student.

But the best reason for taking the archæology problems, the reason why one is required to take at least one of them, is that they are an incentive to the real study of "documents," of books and drawings. In the plan projets documents are used to furnish ideas here and there for a *parti* or scheme; even while they are being consulted one's thoughts are preoccupied with the *parti* and the documents are of secondary importance. In the archæo documents are studied for their own sake. The archæo is, before all, a study in style; and the *parti* or scheme, so fundamental in plan projet, plays no part here except as it may figure as a question of style—of the style called for in the program; the *parti* itself should be studied from documents.

The problem is primarily a study in the arrangement of motives and in the ornament of the style given. It familiarizes one with many documents he would not otherwise look at, certainly not examine carefully. It gives one many new and interesting dispositions of architectural forms and enlarges one's knowledge of different details. It is one of the surest methods of creating an architectural vocabulary. It is on the discerning use of documents that success in the archæology projet depends. The problem may be a "Pompeiian Court," to choose one at random, but the documents must furnish not only the architectural details of the court but all the accessories that go to make up the composition and, especially, an insight into the life of the people of

Figure 209. Archæology Projet, "A Cast Iron Balcony," L. C. Licht.

the period, for an intelligent study in archæology cannot be made without some understanding of the manners and customs of the time.

It is here that the student in the city has a great advantage over one in a small town. In New York, for instance, as well as Boston and Philadelphia, there are several architectural libraries of the first rank accessible to all, and most of the larger architectural offices have libraries of a great number of well selected books, although in exceptional cases, such as "A Tribune in a Turkish Mosque," or "A Studio in the Russian Style," Figure 207, most of them would be found wanting, as such documents have no direct bearing on modern practice. Such problems are, of course, all the more interesting as they take one into unknown lands. But even in a small town the student can find documents, if he will look, perhaps in books of travel, or in files of the "Geographic Magazine", or in the circulars of travel agencies.

With ingenuity much can be done with scanty documents. Figures 204 and 205 show two different solutions of an "Entrance to an Assyrian Palace," each giving a convincing idea of reality and satisfying one as to being in "style." If we examine them closely, however, we find that almost every motive used in one may be found in the other, though used in a different way—the cheek blocks of the steep ramp in the first appear in the foreground of the second; the tower treatment is the same in each except for the top; the loggia in the top of the second shows at the back between the two towers of the first; the Assyrian "winged men" at the large entrance are the same in each; the animals in relief flanking the entrance in the second are shown at the bottom of the frame in the first, and so on. It is seen what can be done with a few documents understandingly used. In fact, these two men worked side by side and had between them only three pages in a history of architecture, part of which was text.

In some cases the program itself imposes a simplicity, as in "A Cast Iron Balcony" of Figure 209; here a great number of motives would have conflicted with the requirements of the style. However, as we shall see later, the presentation itself may be a study of archæology.

Porch of the Church of Saint-Trophime at Arles.
See measured drawing, Figure 222.

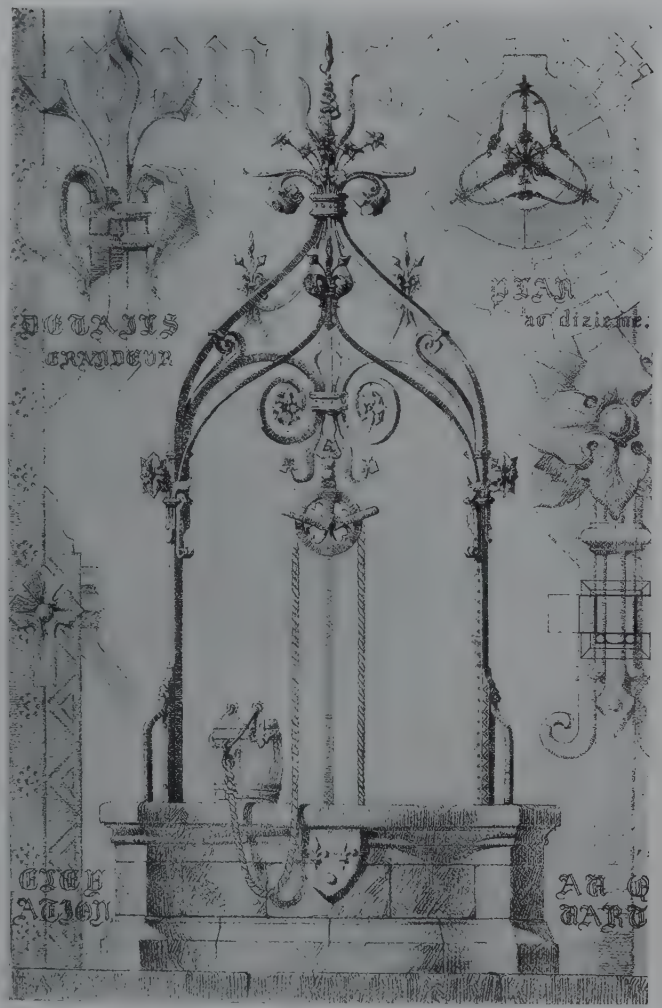

Figure 210. A Wellhead with Wrought Iron Armature, by M. Chatelan, Pupil of M. Héraud, Ecole des Beaux Arts, Paris.

Figure 211. A Wrought Iron Grille, by M. F. H. Haskell, Pupil of M. Deglane, Ecole des Beaux Arts, Paris.

THE ARCHAEOLOGY PROJET AND MEASURED DRAWINGS

Chapter XXII

THE ARCHAEOLOGY PROJET (Concluded)

A MAN who does several archæos, especially if he can go to the exhibitions at the Beaux-Arts Institute rooms after the judgment and compare his work with that of others, will probably have a very clear idea of how he can best study the problem, taking into account his individual training and methods of work.

But for the man who takes an archæology projet for the first time it will be of value to outline a definite method to work on, to avoid some of the usual pitfalls and especially to save valuable time.

In a plan projet much of the time is spent at the beginning of the problem in studying the parti, and until this parti is studied rather thoroughly any time spent on detail is ill-spent. As we said before, in an archæo, there is not this study of a parti, other than hunting through the documents to see what "partis" were used in the style. For the purposes of the problem one is no better than another, provided each is of the required period.

But a much greater amount of time is needed for the presentation of an archæo than for that of a plan projet. For one thing, a perspective is frequently required or allowed in place of two elevations. When such a choice between two elevations and a perspective is allowed, it is much better to present the perspective; the psychological effect on the jury is greater, the skill used in either case being equal, for it gives a convincing sense of the third dimension and always looks like, and actually is, more work. A perspective requires much more time to render than a geometrical drawing, more time even than two elevations; it is less conventional and the usual conventions and rules of thumb cannot be used to the same extent. As it is more realistic, naturalistic, in drawing, it must be equally so in rendering and must depend more on observation of nature for the infinite variety of effects necessary to take away the "paper look" from a rendered perspective. The gradations in value caused by receding planes, by reflected light, by local color, the effects of time and use,—all are very different from the simple effects necessary to render a conventional drawing.

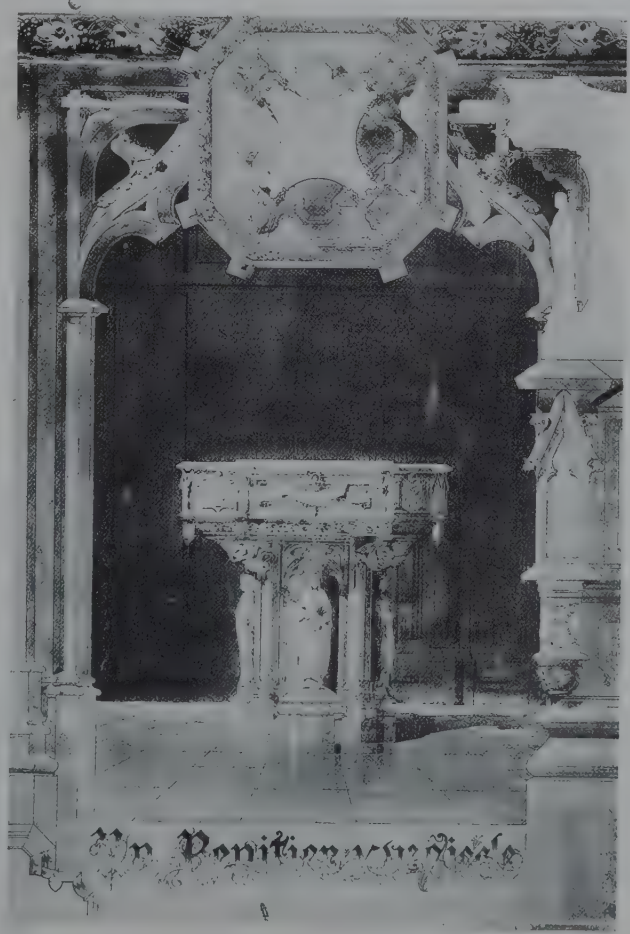

Figure 212.
Holy Water Basin, St. Germain L'Auxerrois, Paris.

But even if the drawing be presented in elevation and not in perspective, there is, nevertheless, more time necessary to render the archæo than a plan projet; the detail must be brought out and atmosphere and the character of the given style imparted. Any human figures used must be in costume and must be convincingly rendered, even though this rendering be free. All this requires more time than the casting of shadows and simple modelling of a plan projet.

This leads naturally to the question of the disposition of the time at one's disposal

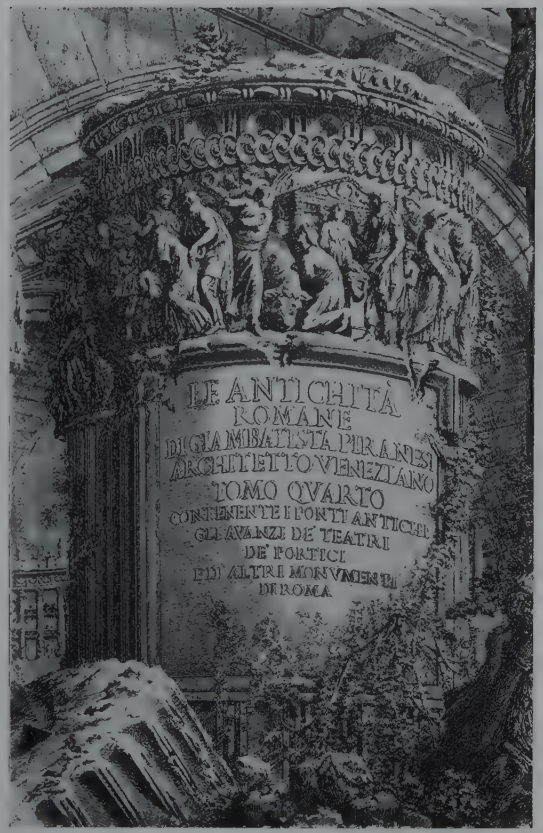

Figure 213. Fragment, Piranesi.

Figure 214. Stair of Old Market, Verona.

Figure 215. Composition, Piranesi.

Figure 216. Reindeer Inn, Banbury.

in studying the archæo. It is hardly necessary to lay out a "schedule of time" as we did for the analytique or "B" plan problem. If we keep in mind that the presentation will require three-fourths of whatever time there is, we see that we shall have available for preliminary study only the first week or ten days. This preliminary study will include the search for and noting of, material, the deciding upon the parti and the general scheme, the choosing of details to be shown and studying these and their arrangement on the sheet up to the final scale.

The first step is to look through all available documents. Look at existing examples of the style if any are at hand, visit the museums to see small objects belonging to the period and look at all the books on the style that can be found, not only the architectural books but also those on the general history of the period, on its manners and customs, its costumes, furniture and small objects of the style, at the work of contemporary painters and sculptors. You will not use all of the material so gathered but it is only in this way that you will get an insight into the time, and put yourself in harmony with the style, so that when you start work on your problem you may give it a true character. You will also have a better opportunity to make a good composition if you have a fair amount of material from which to choose. Figure 217 is part of a set of such notes made for a "Pompeiian Court," mostly taken from Menard's "La Vie Privée des Anciens."

If the problem is in the Georgian or Colonial style (as the cast iron balcony of Figure 209) it is possible for those in the east and south to see actual examples of the style, and that is, of course, the best form of document. The books should be used at the same time to show other examples so that one may see what characteristics were common to all, what were the earmarks of the style in question, and what was peculiar to the single example.

At the Ecole at Paris, of course, existing examples are much more available, Europe and Paris itself, having many centuries of architectural forms to their credit. Thus the program of a competition for a "Wellhead with Wrought Iron Armature," of which Figure 210 is a solution, mentioned as examples for study the well of Quentin Massys at Ghent, one in the Court of the Hôtel Dieu at Beaune, one in the courtyard of the Museum at Troyes, one at the Musée Cluny, one at Château Nantes, one belonging to the Church of Notre Dame at Epure, and one at Chenonceaux, all within a radius of a few hours from Paris.

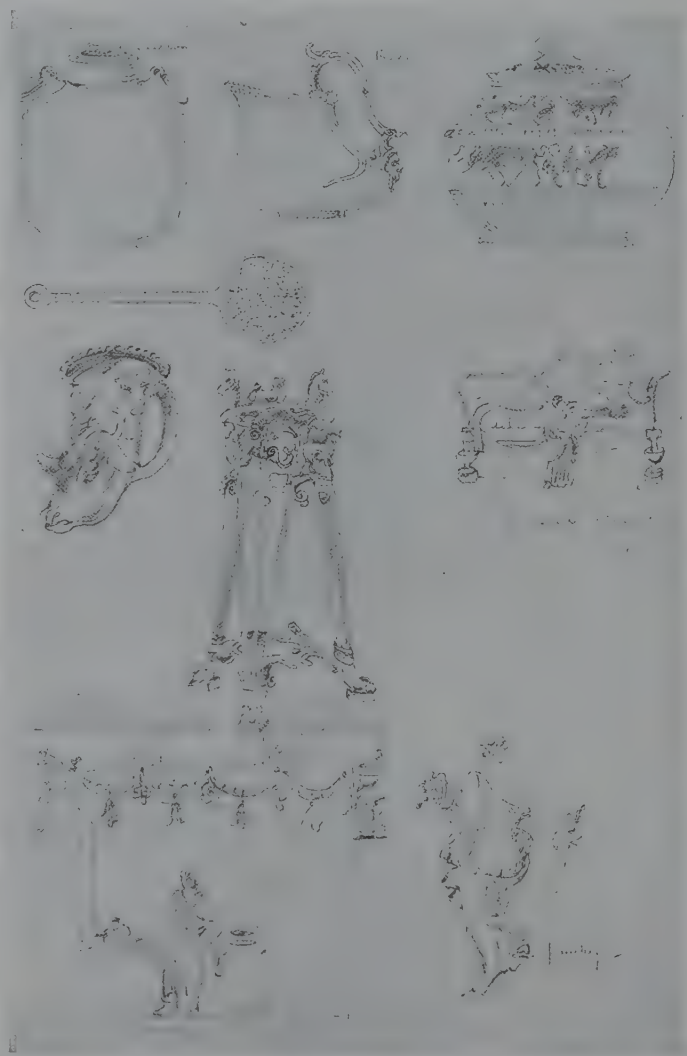

Figure 217.
Notes Made for the Study of a Pompeiian Archæology Projet.

Another program called for a holy water basin in an existing church at Paris, Saint Germain L'Auxerrois, Figure 212. Even in the case of Figure 211, a wrought iron grille for a church at Salamanca, the subject of the program, and examples of the style, were no further away than New York is from Boston.

While problems are not often possible, as yet, in this country, in a style in which existing examples may be studied, it is well to remember that many of our museums contain collections of the smaller objects of a period, things that will give color and life to a problem, jewels and pottery and tomb sculpture for an Egyptian problem, Grecian urns and bronzes and figurines for a Greek

or Pompeiian one, ivory caskets, armor and furniture of the Middle Ages and Renaissance, etc. Figure 219 shows one such example, a group of Italian faïence of the Fifteenth Century at the Metropolitan Museum. The value in going to the museum to study instead of doing so from photographs is, of course, to note the color, surface, texture, etc. Small objects such as these not only explain the style to the student, but they make a composition more interesting.

Having, then, collected your material, you are ready to make your first studies. Lay out the elevation, or elevations, at the required scale if that is not too great to handle at the start; otherwise start at half the final scale. Try to put into it as much of the spirit of the called-for style as is possible. If you have noticed any peculiar arrangements in your search through the documents, especially things that would not have happened in another period, use them by preference.

Figure 218. Thumb-nail Sketch of a Composition, by Paul Cret.

Work in where you can any interesting detail that you may have found. H. Van Buren Magonigle in his book on rendering says, when suggesting restraint in the use of many colors in a rendering: "It is the same as in design, the novice forgets that if his luck holds he will design many a building, and that it is not necessary, it is even quite distinctly undesirable, to put everything he knows about into one design. A decent reticence is to be observed in this as in all things in life—one does not go about telling all one knows—all at once." However, as the proverb has it, "there is an exception to every rule," and the archæo is the exception to this one, for it is desirable to show as well as you can, all that you know of a given style.

As parti, proportion, disposition of motives, all come from the documents, this part of the study will require very little time. The next step is to compose the sheet, the final presentation, as was done for the analytique, this time with freer forms. With a soft pencil make thumb-nail sketches of the composition, as in Figure 218, about three by five inches. In making these sketches try to utilize the interesting details you have made note of—utensils, reliquaries, pieces of pottery, bronzes, and free objects, as well as actual details of the architectural fabric. Try to approximate in these small sketches the values of the future rendering – shadows where they are to be, local color where it will be an accent– for these things will be a part of the final effect and will greatly affect the composition. In studying the arrangement of the small scale drawing, if it is in perspective, it will be useful to study photographs, especially European ones, for ideas in composition. Note in Figure 216 how the sharp perspective of the buildings at the right literally "makes" the composition. Cover this portion and see how much is lost in the effect. Figure 214 shows how much interest may be added by part of the composition coming well into the foreground; such a part in a rendering would be treated simply—almost "out of focus," as would happen to similar portions of a photograph.

When you have made an arrangement at small scale that is satisfactory, it may be then laid out in charcoal directly at the final scale on a large sheet of tracing paper, or at any rate at half the final scale. In either case, block in the work in charcoal, locating the big masses of the small scale drawing, whether perspective or elevation, especially the larger shadows, and rough in the details. When this is all blocked in in this way, stand the drawing up against the wall and look at it from five or six feet away, for that is the best test of a composition of this size. You can now see if there are any portions that need to be rearranged; if the details form a pleasing silhouette; if the lines of the composition lead in to the "focus," or important area.

As the charcoal is very easily wiped out with a chamois skin to a surface sufficiently clean to be again drawn on, it is possible to study the composition on this one sheet until the massing is satisfactory when seen from five or six feet away. Until it is satisfactory in composition in this charcoal stage it is useless to pass on to the next, for the final rendering will not hide anything that is "unhappy" at this stage.

Passing to the final drawing is now a simple matter, though it will occupy, as before stated, three-fourths of the time given for the problem.

The different portions of the drawing may be drawn in pencil on separate sheets of tracing paper over the charcoal study and these rubbed on the final sheet, or the entire composition may be drawn on one sheet of tracing paper over the charcoal study and rubbed on the final sheet, or the work may be drawn directly on the final sheet, laying off the arrangements to the measurements of the charcoal study. To some extent the character of the drawing on the final sheet will depend upon the technique adopted for the rendering. If it is to be pen-and-ink, for instance, and the pencil rubbed off, or in opaque water color – in which case the pencil

lines will be covered up—the actual drawing will not matter much, provided it serves as an indication for the later medium.

If the rendering is to be in water color, which is transparent, or in pencil, the individual lines are important. Lines should not go further than the object they are supposed to delineate, for in a perspective the crossing or "snapping" of lines gives a very thin and "papery" effect.

Carry the rendering of the whole drawing on at the same time, put the early washes over each part before finishing up any one portion.

One who has worked only in water colors and used these mostly in washes, will find it interesting to finish an archæo, after the color washes are all on, with a "Wolff" pencil (2-B), an English carbon pencil that does not "shine" or reflect light rays as do graphite pencils. With this pencil it is possible to render texture, for it lends itself equally to work in lines or in tones in which the actual lines are not visible, almost like charcoal, in fact. A drawing so finished should be sprayed with "fixative" before being cut from the board.

Another interesting way to finish an archæo rendered in water color washes is to take a ball-pointed pen – a "6-B pen" as Professor Arnal calls it–and render freely on top of the color, observing the usual rules of pen-and-ink, such as avoiding the cross-hatching of lines, omitting lines on the lighted edges of surfaces, etc. This technique was used in Figure 208.

The rendering may often be inspired by the style of the program. A Louis XIV composition would look well with a presentation studied from Lepautre or Marot. The mention of English Tudor immediately brings to mind the drawings of Nash's "Mansions Of England In The Olden Time," of one of which Figure 220 is a reproduction.

Figure 219. Italian Faïence, Late Fifteenth Century, Metropolitan Museum of Art.

Of course, a good technique of presentation can be used as a document for any problem. The plates of Piranesi, for instance, will serve as inspiration for a severe and new structure as well as for time-worn, moss-grown pieces. Compare Figures 213 and 215, both by Piranesi. It will be seen that any scheme of rendering inspired by documents requires infinite patience and care, as well as a great amount of time. On the other hand, there is nothing that serves so well to increase one's ability in rendering and in presentation as an archæology problem. Unhampered by thoughts of parti, or arrangements of difficult corners in plan, of mosaic made up of an infinite number of lines, one's attention is left free to concentrate on presentation, on the arrangement of the lines in the composition, of the masses of different value. One will learn how uncomfortable arrangements of the lines may be softened and made inconspicuous by the treatment of the tones of the masses. In fact, nothing is better as a training for a renderer than studies in these archæo projets, especially if he is fortunate enough to work under a critic who understands composition and rendering.

Figure 220. The Banqueting Room, Bramhall Hall, Cheshire, England.

Figure 221. Tomb in the Church of S. Domenico, Bologna. Drawn by M. Chedanne. From D'Espouy's "Fragments D'Architecture de la Renaissance."

Figure 222. Doorway of Church of S. Trophime at Arles, France. Drawn by Douglas D. Ellington. This drawing was awarded a medal of honor at the Paris Salon of 1912.

THE ARCHAEOLOGY PROJET AND MEASURED DRAWINGS

Chapter XXIII

THE MEASURED DRAWING

SINCE the beginning of the Renaissance in Italy when Brunelleschi, Bramante, and the others down to Michel Angelo made drawings of the classic remains in Rome, the "measured drawing" has had a fascination for the real "student" of architecture. Many measured drawings have been made primarily for publication as records for the use of designers. All our familiar "documents" are measured drawings. Letarouilly's "Edifices de Rome Moderne," César Daly's "Motifs Historiques," Pfnor, Garner and Stratton,—all the well known names, including the many volumes of Piranesi's engravings of Rome, are compilations of such measured drawings. From time to time later investigators checked up and revised some of these measurements. A recent Fellow in architecture of the American Academy in Rome found an error in the plan of the Villa Gamberaia as laid out by Percier and Fontaine. When measurements are undertaken for publication purposes and a large field must be covered, as is frequently the case, it is assumed that two sides of a form are alike, and a more careful measurement may show a distinct variation (as in the Villa Gamberaia).

A measured drawing is required by the Beaux-Arts Institute course, not as reference material, but because it is an excellent training in the study of profiles and of execution, of ornament, of surface textures. It is a connecting link between design, creation and execution, and it is by executed work that architectural ability is finally judged, not by drawings. Indeed, when the most clever men at the Ecole have won the "Prix de Rome"—have reached the apex of student achievement,—they are sent to Rome to make "measured drawings" of the architecture of past ages. It is these measured drawings that were published in the work we speak of as "D'Espouy." Of this work many examples have been given here, all of them of the classic school. The Grand Prix men study fragments of other work, of the French and Italian Renaissance for instance, and of the Middle Ages. Figure 221, an example of Italian Renaissance work, is of a very beautiful piece of architectural sculpture, and the drawing is in itself beautiful; note the ability with which the sculptural forms are modelled by the conventional system of shadows and washes—the careful picking out of high-light, half-tone and shadows.

Figure 223. Fountain, Piazza San Pietro, Rome. Drawn by W. J. H. Hough, Fellow, American Academy in Rome, 1914-17.

Figure 224 is a flat ceiling in the Farnese Palace at Rome measured and drawn by the late Victor Laloux, later "Patron" of one of the ateliers at the Ecole des Beaux Arts;—it is simpler in rendering, but a complicated drawing, ably presented.

A measured drawing is required also at the Ecole. In the one by Paul Cret, the doorway of the Lycée de Lyon, Figure 225, note again the careful rendering — especially the modelling of the sculptural forms by the division into high-light, half-tone, and shadow, and the rendering within the shadows by the use of reflected light and back shadows. The planes

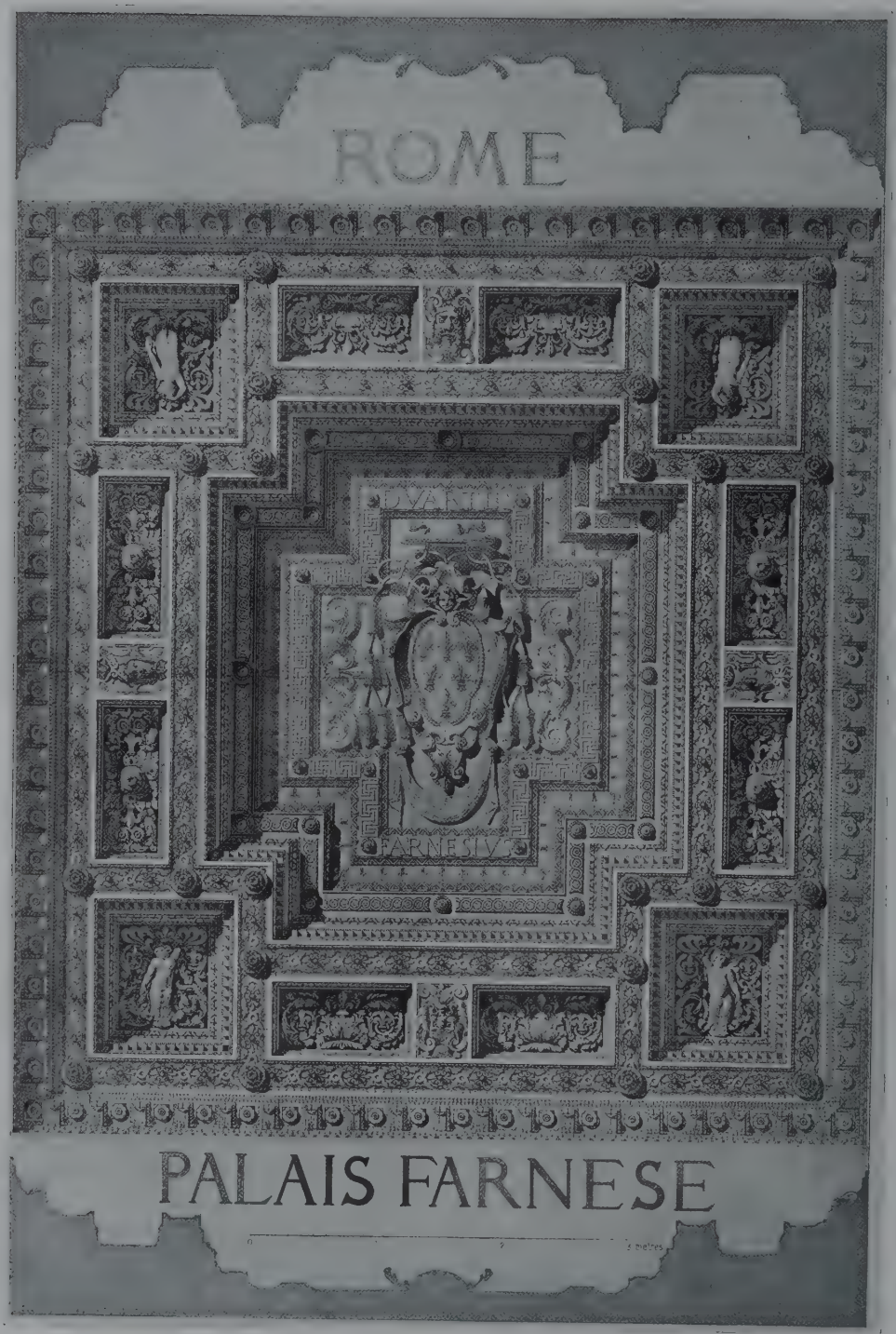

Figure 224. Ceiling in Farnese Palace, Rome. Drawn by Victor Laloux. From D'Espouy's "Fragments D'Architecture de la Renaissance."

Figure 225. Doorway, Lycée de Lyon. Drawn by Paul P. Cret while a student at the Ecole des Beaux Arts, Paris. Note: the rising of the general level of the city has cut off the lower part of the door and given it its present proportions, almost those of a fireplace.

take their place forward or backward by the value of the wash or tone. Here, as in most of the D'Espouy plates, the mouldings are rendered by dividing them by a series of parallel lines, and rendering by washes of graduated tones, as explained in Chapter VIII. In this instance the lines are fairly close together and the lines disappear in the reproduction at a reduced scale.

The men at our own Academy in Rome now make measured drawings in the same way. The Ponte Rotto, Figure 226, by Wm. J. H. Hough, was built by Pope Gregory XIII in the Sixteenth Century. The presentation is inspired by the engravings of the time of Piranesi. The fountain of the Piazza San Pietro, Figure 223, by the same author, shows a very clever representation of water. Unfortunately a black and white reproduction does not show the variations in color of such a rendering: the student should look for drawings of this character at the architectural exhibitions and study the use made of color in modelling, and note changes in local color due to shadow, reflected light, etc.

A student is fortunate when he has the opportunity to take measurements abroad for his measured drawings. There is such a profusion of usable material there that our own younger country seems bare indeed. Perhaps the best measured drawing ever made in this country was that by Douglas D. Ellington, winner of the 1911 Paris Prize, from measurements made on a European trip in 1910 (Figure 222). This is not only a good measured drawing but a masterpiece in presentation. The technique is an "archæo" in itself, studied as it was from Piranesi's engravings of Roman fragments, though Ellington first made a modelling by a series of light washes of a bluish gray water color. One seeing the crisp lines of the presentation is apt to forget that a number of studies must be made before hand, not only of the composition of the sheet and the arrangement of tone values, but also of the modelling of the different fragments. In this case such studies were made first in charcoal and then with a 6-B pencil, which approximated the pen-and-ink technique to be later followed. A reproduction can hardly do justice to this technique—the drawing was made on an antiquarian sheet and loses considerably in reduction.

But it is possible to find interesting subjects in this country, new as it is compared to Europe. We have Colonial work in the East and South, which furnishes both exteriors such as the Portico of the Wakeling House, Frankford, Figure 230, and interiors such as the State Parlor of Stenton, Germantown, Figure 227—the home of William Penn's first Lieutenant Governor—and the pulpit in Old Swedes' Church, Philadelphia, Figure 229.

Some work of the classic revival—the period about 1830—is available for material, including some interesting tomb monuments. In the West and in Florida are the old Spanish Mission Churches. There are also some exotic things in this country: in museums, such as the Metropolitan in New York, will be found an Egyptian Tomb—a Turkish doorway, and entire rooms from the Tyrol, etc. The other large museums of the country have similar available objects. In Philadelphia, in Fairmount Park, is a Japanese Temple Gate and a Hindu Temple; in the University Museum an Aztec Wall—

Courtesy of The American Academy in Rome.

Figure 226. Ponte Rotto, Rome. Drawn by Wm. J. H. Hough.

and so on. If one is sufficiently interested, a subject can easily be found.

Having chosen the subject it is well to remember that measurements are useless unless they are completely and accurately taken.

Cross section paper is convenient for making the survey: the mouldings should be carefully plotted. This may be done by dropping a plumb line from a projection and measuring back to the face at different points. For securing a really accurate profile one should have a thin strip of lead that can be bent against the moulding, and then placed on paper while the profile is traced. Try the same profile at several different points on the moulding to allow for inequalities in execution.

Figure 227. State Parlor, Stenton, Germantown, Pa. Drawn by Gerald K. Geerlings.

For ornament or sculpture, studies should be made in charcoal and measurements taken of important points, very much as sculpture is "pointed" up to a larger scale. Photographs are of great use and as many as possible should be taken of the subject from every direction—especially if it is in a foreign country or in an inaccessible place—so that there will be a chance to check up on any errors or omissions. Photographs are helpful in rendering, they show the "modelling" of surfaces in a convincing way. Figure 228 is a photograph taken for such a purpose, with the shadows at almost the conventional angle though the source of light is at the right instead of the left.

Indeed at the Villa Medici when the men who have won the Grand Prix de Rome are making the careful renderings we are familiar with as "D'Espouy" plates, they take a cast of a cap, for instance, out into the garden, turn it until the sun is in the proper direction for the conventional architectural rendering, and then mark—directly on the cast—the trace of the shadows on the object.

As a long time is given for the measured drawing—all of the season, or even all of two seasons, if one has his subject reapproved at the beginning of the new (academic) year—much is expected in the way of presentation. Something more than the usual composition of the sheet is looked for.

This does not mean that more articles must be grouped together, though a complete presentation as in Figure 230 may be very satisfying,—but simply a greater effort at composing well what one has decided to use, whether it be simple or complex—it may be only one drawing, as in Figure 223. It is then a question of determining where on the sheet the drawing shall go. Where details are shown, the relation of these to each other and to the central drawing must be studied as for the analytique, but carried further, because of the greater time allowed. In Figure 227 the furniture is added to "make a composition" of an uninteresting piece of paneling, and the pieces of china in the cupboard give a needed point of interest.

The drawing must be carefully—neatly—done, and any lettering used as a part of the composition must be studied in its spacing, and in its relation to the rest of the drawing; such attributes as the china just spoken of, costumes of figures, etc., should be of the period, and may be found in books or museums; and finally the rendering must be good, as there is no excuse for carelessness when time is practically unlimited. In Figure 229, for instance, you will see the same modelling of the moulding, by means of washes within parallel lines, as in the French plates, and yet this drawing gives the appearance of great simplicity of presentation. Make studies of the presentation first in charcoal until the values are right and then make a study in color before starting the rendering of the drawing itself.

Figure 228. Photograph of Renaissance Detail.

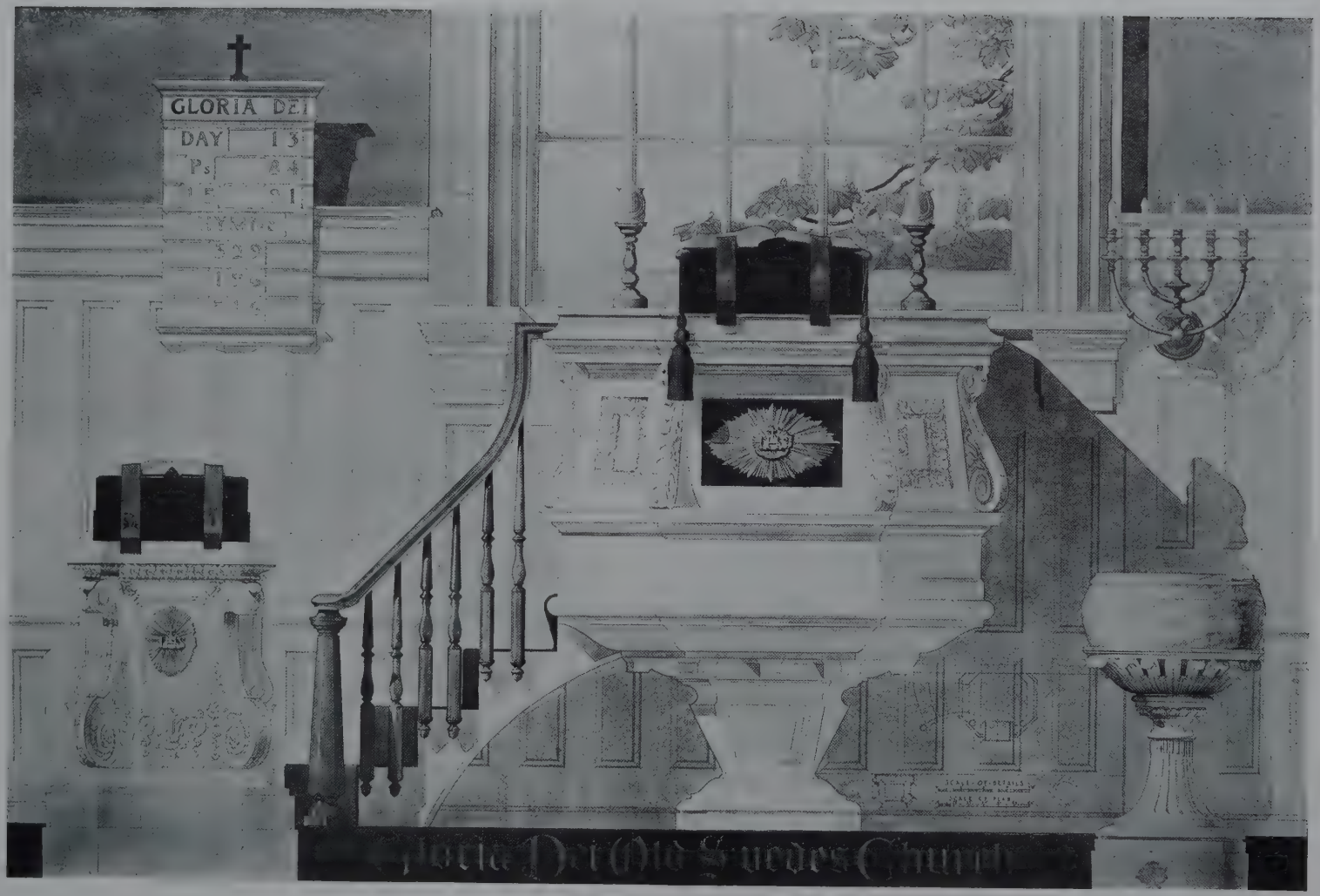

Figure 229. Pulpit in Old Swedes Church, Philadelphia. Drawn by Lawrence C. Licht.

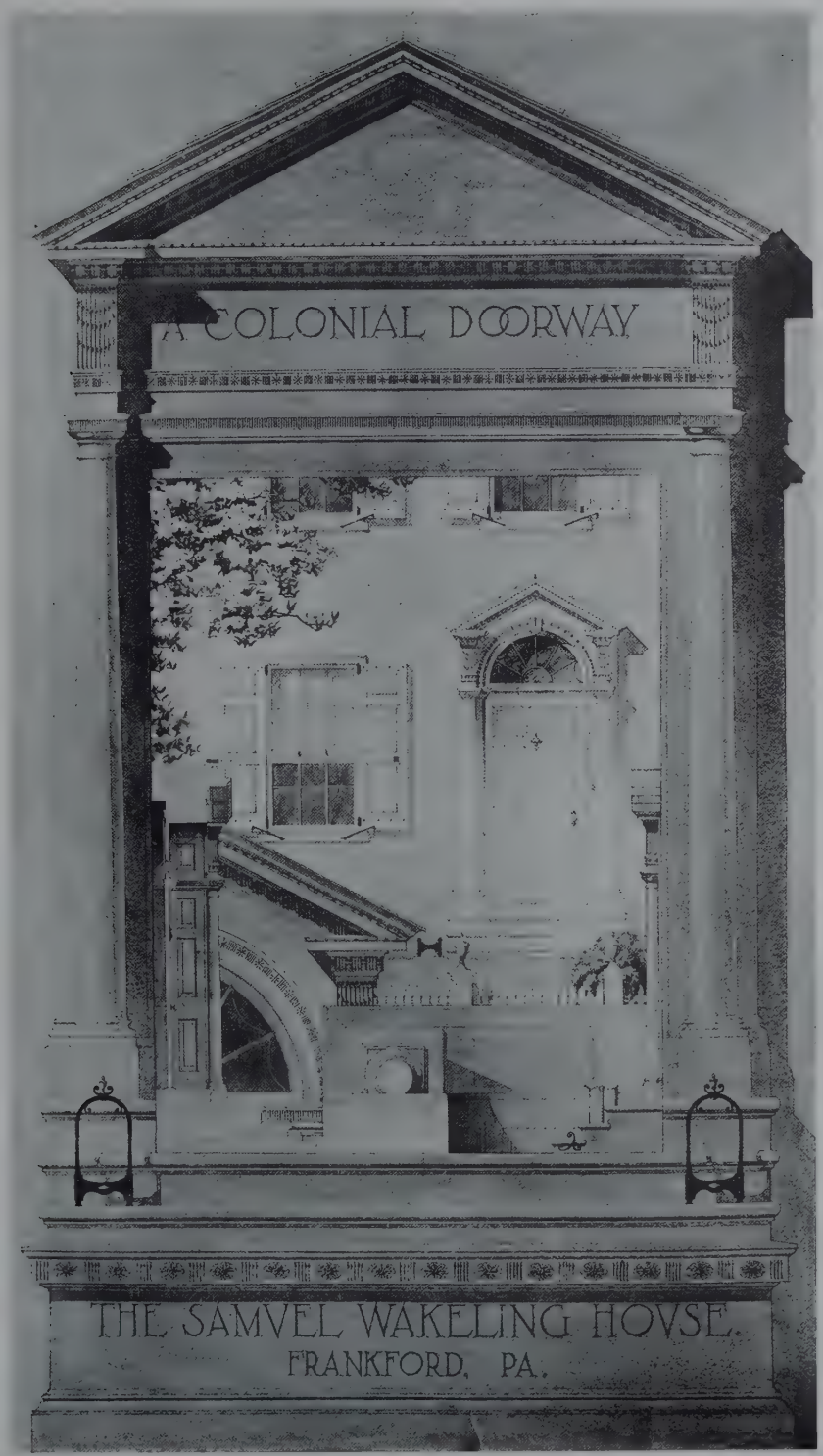

Figure 230. Entrance, Wakeling House, Frankford.
Drawn by Bradford Tazewell.

Figure 231. Concours Labarre, "Une Station Estivale". Design by M. Grégoire, Pupil of M. Paulin.

THE STUDY OF ARCHITECTURAL DESIGN

Chapter XXIV

REVIEW

THE student has now reached a stage in his career when it would be well to take account of the future—and of his success thus far. In the first place has he any doubts as to his desire to stick at architecture? If there is any doubt about it, now is the time to thrash out the question in his own mind—with the help of any serious advice he may be able to call upon. He has already spent a considerable amount of time in studying to fit himself for his profession. This time represents money. It could have been used at times for making money, undoubtedly. Technical training and the experience one gains in working are about the only capital that many professional men have. If there is a question of going into some other calling, it must be remembered that that calling will doubtless require some training and that training will take some time; if deferred too long, it would jeopardize the success of the man in that line of work.

Your contact with architecture thus far has been with its most attractive side—that of design. If that has not appealed to you—has not turned out to be what you thought it would be—look about to see if something else would interest you more. Architecture has other sides; structural and mechanical problems, specification writing, office management, usually gravitate to those who make a special study of these fields and such work may lead to as high rewards, financially, as design, depending upon the individual's opportunities and fitness. If you decide to try something else, the training you have had thus far will not in any sense be time wasted, but will have opened up to you, for the rest of your life, pleasures you would not otherwise have sensed.

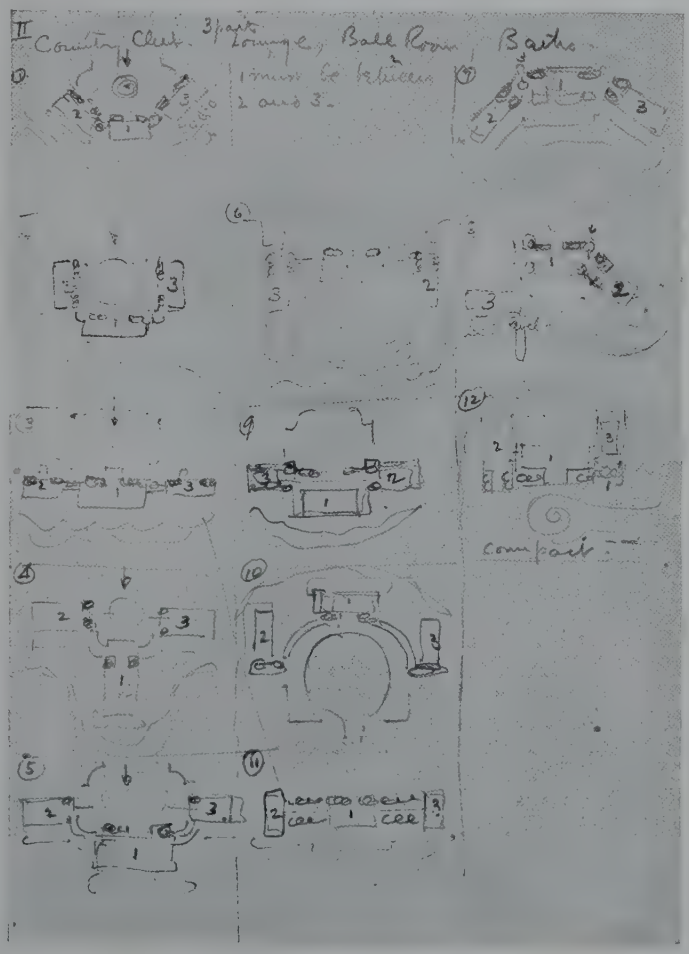

Figure 232.
Diagram of a study of parti for "The Casino of a Country Club".

If you decide to continue in architecture, then you must realize you should continue your training. It is a great mistake to stop your study of design with Class B work. It would be like trying to practice medicine after two years in a medical school. If Class B work has made you more valuable in an office — and to yourself — that increase in value is, in reality, small as compared with the results of study in the Class A projets. As in all training, the knowledge gained is cumulative, and the ability to increase one's knowledge, the speed with which

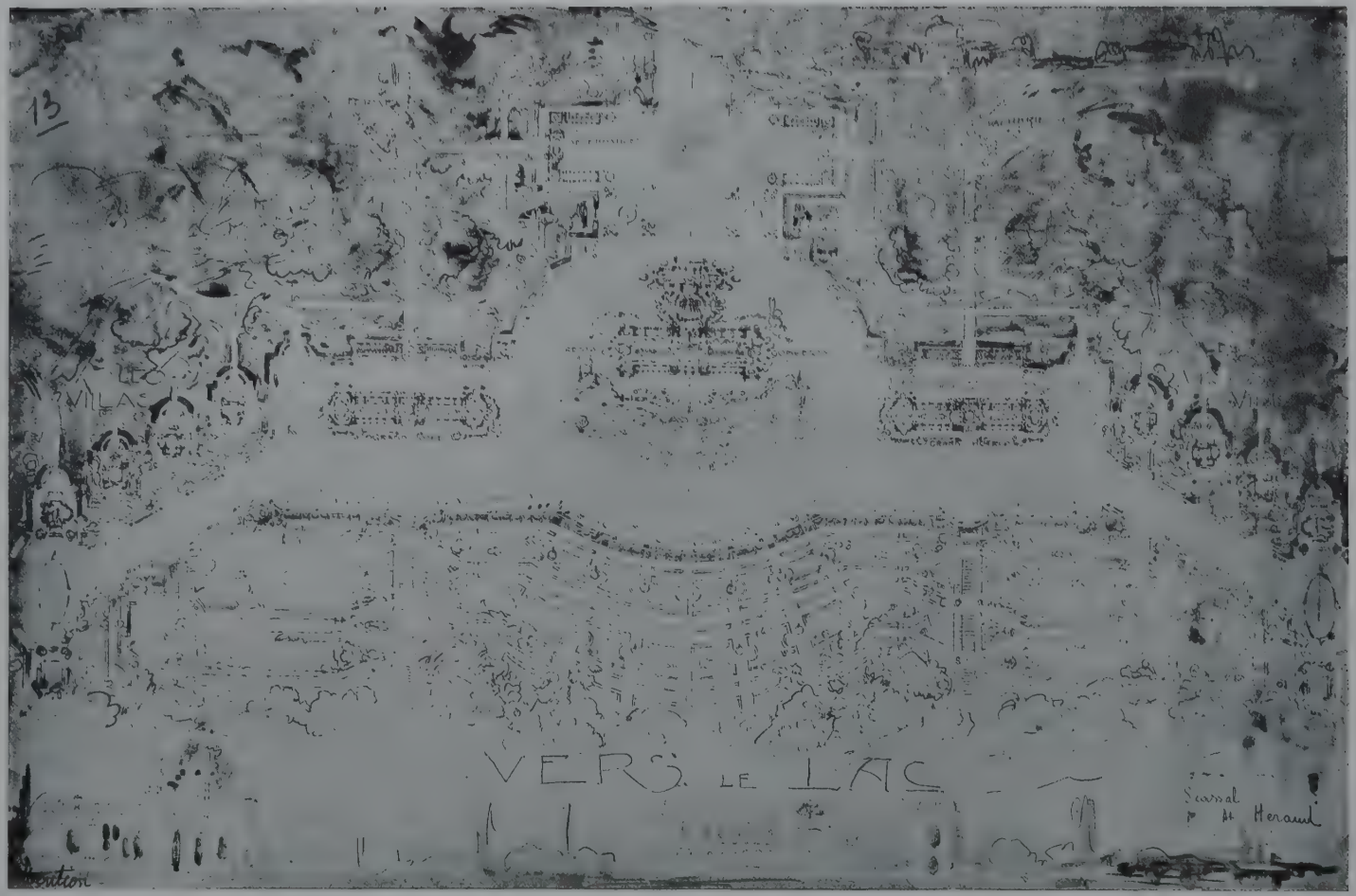

Figure 233. Concours Labarre, "Une Station Estivale". Design by M. Séassal, Pupil of M. Héraud.

Figure 234. Elevation of Design for Nebraska State Capitol Competition, By Paul P. Cret and Zantzinger, Borie & Medary, Associated Architects.

one's knowledge is increased, is accelerated progressively, with each step. It is poor business to stop your study at this point.

But this is a good time to go over what you have done and see if there are any weak corners in your ability.

In previous chapters we have spoken of the esquisse—of its value in mental training. Do you make a good esquisse? Or do you find yourself often struggling through a problem, trying to make something out of a poor esquisse—an esquisse that really does not solve the problem?

If so, it would be worth your while to make a real effort to improve in this direction. One way to do so is to take every esquisse—whether Class B or A, archæology or prize problem—simply for the training to be had in thinking out a parti.

After the others have turned in their esquisses discuss your solution with them. Make a little diagrammatic note of the different solutions as in Figure 232. If you live near New York, go to the exhibition after the judgment of these problems and add to your diagrams the new solutions you will see there, noting especially the premiated designs. If you cannot see the exhibition, watch for the publication of the premiated drawings and then add these solutions to your diagram. If you do this for a number of problems you will see that the programs call for a "three-part scheme"—meaning there are three important divisions—or a "four-part scheme", or a scheme in which there is only one dominant part, etc., etc., and that in each of these divisions there are several different arrangements that it is well to know.

Another similar scheme for improving one's ability at finding a parti was suggested by the late John Wynkoop, one of the early winners of the Paris Prize. It was to take one of the programs in a volume of "Les Concours d' Architecture de l'Anneé Scolaire 19 -19 "* and try in the same way to form a solution for it, or several solutions, and choose that which you feel to be the best; then turn over to the plate pages where the solutions are shown, and note the premiated parti. For this purpose the annual competition for the *Prix Labarre* is particularly good, for it is a sketch problem principally in the finding of a parti, and usually ten or twelve of the solutions are reproduced. Figures 231 and 233 are two such solutions for a summer health and amusement resort. To do this, one must have some knowledge of French, to be able to read the programs—or have some lessons in grammar and the use of a good dictionary.

If you ever expect to do competition work, it is well to remember that your success will in large measure depend on your ability to find a "parti."

Aside from the esquisse, have you studied your problems well? Have you planned your time so that you were able to make a good presentation? Did you get the most possible out of your critic? Do you present your thoughts to him as complete ideas—plan, section, elevation, even if only in sketch form?

Do you study a problem logically? Do you try out many ideas or keep in a rut on the first one that suggests itself to your mind? Do you confine your

** The work done at the Ecole des Beaux Arts in Paris, published each year at inexpensive prices by A. Vincent, 4 Rue des Beaux-Arts, Paris, and obtainable by mail without the payment of duty, being entirely in a foreign language.*

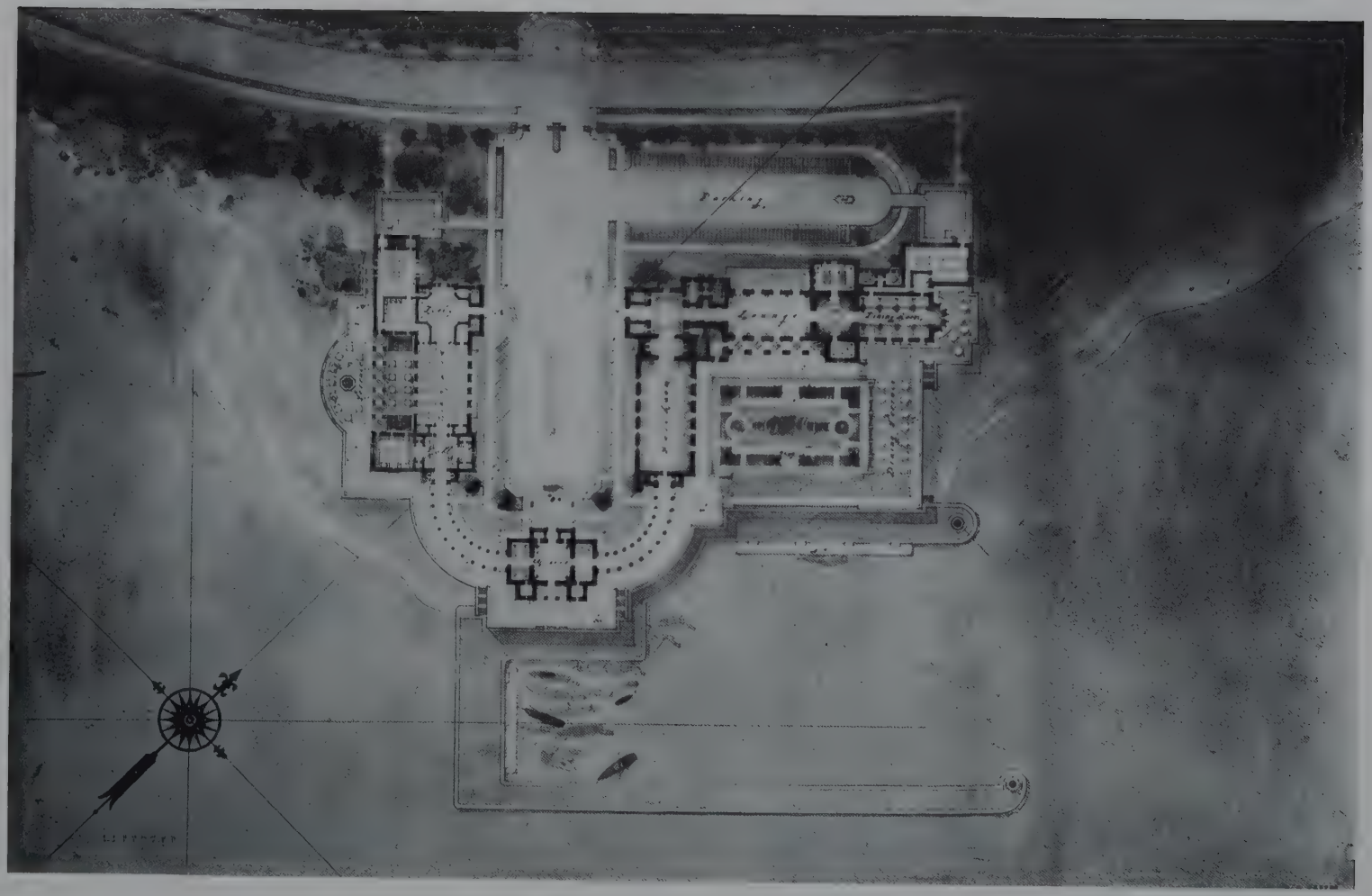

Figure 235. Plan—"A Yacht Club in Florida", by Darwin H. Urffer.

thoughts at the beginning of a problem to study of the big idea, and then gradually work to the detail at the end, or do you think about details from the start and thus cloud the big ideas?

Do you use documents in studying your problems, to give new viewpoints, to build up a vocabulary of forms, of ideas, of schemes? Do you note what gives character to plans, elevations, sections and details?

Can you draw well enough to express your thought—render well enough to present it to best advantage?

This is a good time to put such questions to yourself. If you find weak spots, concentrate on them at this time so that when you go on to Class A you may not be handicapped in competing with others who are well prepared.

If you are weak in parti do all the sketch problems, and you will watch the results of the judgment with an added interest. If you render badly, try the archæology problems. You must recognize your faults in order to overcome them; it is only when a man refuses to be honest with himself that he cannot cope with his shortcomings.

And do not forget that one of the greatest advantages of studying in an atelier is the spirit of cooperation—the give and take, the willingness to help others, whether higher or lower in the scale of attainment. Do not avoid "niggering" for the Class A man, or for one of your own class who has fallen behind. The atelier's good will be your good —its success will be your success; if you can win the prize yourself, well and good—but at any rate, *try to have some one in your atelier win it.* If there are three prizes, try to have your atelier win all three—it may not do so, but this is the spirit that will bring success to the atelier, and to you. If the quality of work in the atelier improves, your own will in the same ratio.

Do not think that "niggering" is doing a favor to someone else. The good in it is largely to you; if you have any doubts about it, try it in your office. Ask if you can help with a big perspective,—stay after hours and ask if you may help with a presentation drawing. Do you know someone who is expert at rendering? Ask him if you may run some small washes,—put in small shadows, and put in the ruling pen shadows, under his direction. When you make your next problem you will see just what it has done for you. Figure 234 is such a rendering, by Paul Cret, in which the ruling pen shadows, small washes, etc., were done by young men who wanted to "nigger" on this competition drawing. Doing team work is the means by which many successful men have made their own place in architecture. Try it for yourself and see.

Figure 236. "A Yacht Club in Florida", by Darwin H. Urffer.

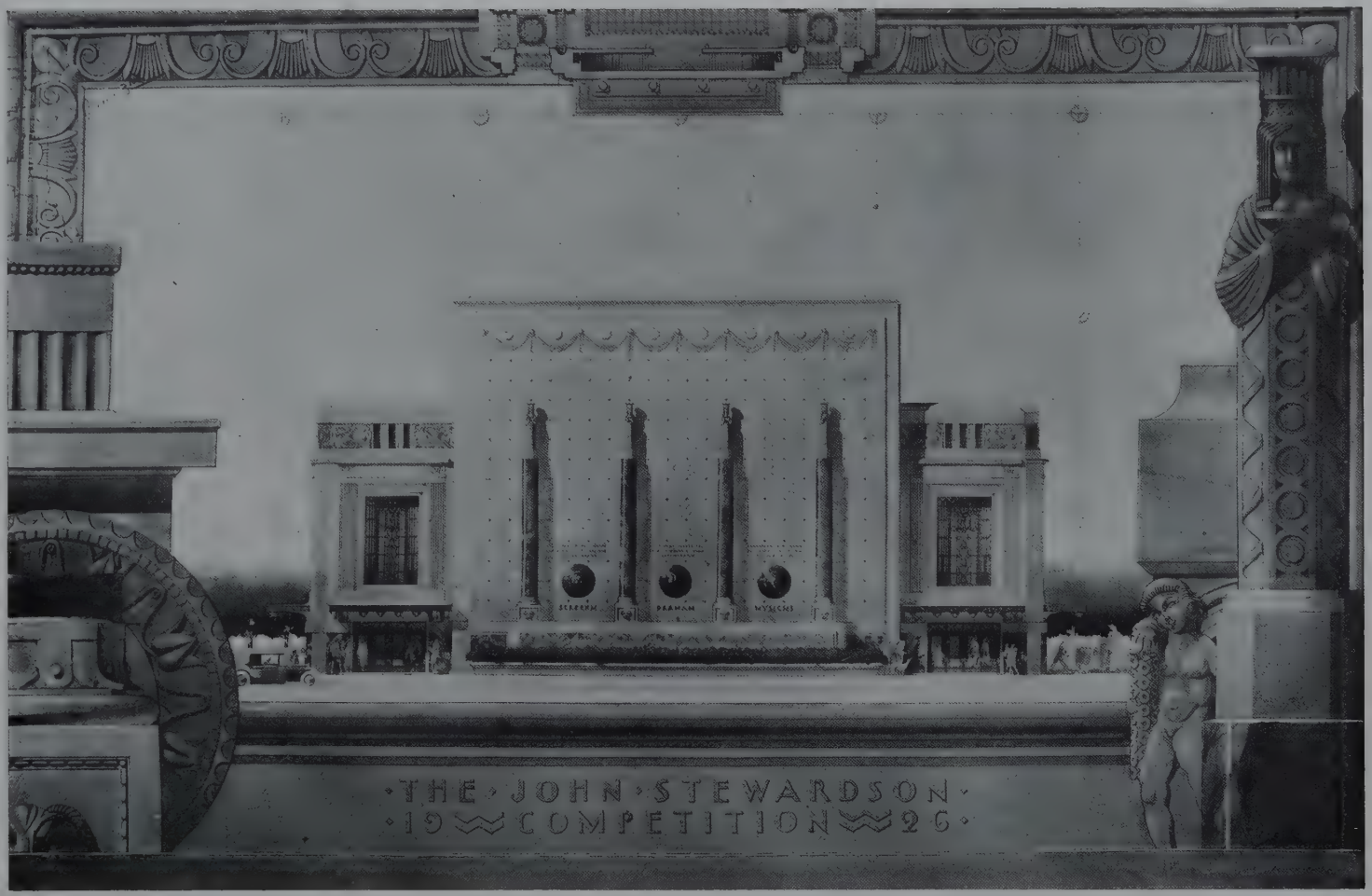

Figure 237. "The Façade of An Auditorium", by Darwin H. Urffer, Stewardson Scholarship Competition, 1926. The program called for two groups of entrances which were to be the only openings in a blank wall, to be treated in a decorative modern spirit, the details not to hark back to the historic styles.

THE CLASS A PROBLEM

Chapter XXV

THE ANCIEN

WHEN a man arrives at Class A he becomes what is called in the Paris ateliers an "ancien"—a veteran. To pass from Class B to A is a much bigger step than to go from the Analytique to Class B plan.

The work is different—considerably broader in scope, with studies in mass composition, group plans, monumental conceptions—government or "official" architecture, many of them—as well as more intricate problems in the plan of single buildings than in Class B. The "Municipal Market" (Figures 238, 239) is one of these, which won the prize of the Municipal Art Society—for prizes are given regularly for some of the Class A competitions. This program called for several markets—meat, fish, vegetable and grocery—to be housed in one building, with a restaurant and outdoor flower market attached. The restaurant alone would have made a Class B problem; consequently, the Class A problems are *usually* presented at a smaller scale than those in Class B; and, because of the smaller scale of the drawings, "indication" is more used.

But here as before—and to an even greater degree—the "parti" is still the first consideration. The program *must* be solved. A poor parti, no matter how well presented, will not win a "first medal". It is interesting to compare this problem with one of its competitors (Figures 240, 241). Without knowing more of the program than is outlined above we see how much more satisfying is the prize-winning scheme: in both plan and elevation we see at once in it the "restaurant" and the "market", unmistakably expressed.

In the same way in the two schemes for "A Shopping Center" shown in Figures 242 and 243, though both sets of drawings are ably presented we can see why one is given first medal, the other second medal. The program called for a building in which a number of retail shops were to be located, all grouped about a central light-shaft, those on the upper floors to be reached by elevators. In the first medal scheme (Figure 242) there is but one cross corridor, on which the elevators are ranged: it is easy to see all the elevators from any point in this corridor; it can afford to be spacious enough for comfort and for good proportion; and with these benefits of circulation and appearance there is left the maximum amount of rentable space for shops on each floor. The second medal scheme (Figure 243) has two elevator corridors, hence each is somewhat cramped, and, of course, the elevators must run independently—one bank cannot at once relieve congestion on the other, which means less efficiency in the running of the building; and these two corridors together, though each is narrow, encroach on the "rentable area" to a greater extent than one corridor of more ample proportions. We see here the first floor plan only, but this arrangement of elevators is, of course, the same for all the floors, and the loss in rentable area and in economy of operation becomes quite sizable in amount when the entire building is thought of.

Now these differences were already established in the esquisses—and the esquisse took only nine hours, and was made "en loge". No amount of criticism, from the cleverest patron, can make a first medal projet out of an esquisse that has inherent faults. A first medal drawing requires a lot of hard work, serious study, good draftsmanship and rendering; but many a problem has all these and does not win a medal. *Most medals are won* in the few hours spent *in making the esquisse.* It will be easier now for the student to realize the importance of evolving a good parti, and to appreciate the value of the esquisse as the mental training it was said to be in Chapter I.

These problems in Class A are much more difficult than Class B plan problems—require more hard work, more constant work. The college man can take one after another through the year—he has time set apart for that purpose, though even he will find it a grateful relief and a stimulation to his tiring imagination to change to an "archæo" for one problem. But the atelier man who works in an office finds it almost impossible to take each problem of a season. The work is so hard he becomes "stale", so that when a prize problem spurs him to show his mettle he finds he cannot do his best. It is much better to drop a problem now and then, or substitute an archæo with its longer time and easier requirements.

But even though a problem is skipped it is well to take the esquisse, because the mental training is valuable beyond all proportion to the time required. And making a parti for a problem is fascinating in itself, being as truly creation as any work in any other art. There is the same satisfaction in accomplishment, in making a good parti, as in making a success of any difficult piece of work. Ability in this depends partly on natural gifts, but as in most other things practice makes for perfection, and if one's natural gifts are not great, constant practice is essential.

Figure 238. Class A Problem, Elevation, "A Municipal Market," T. P. Yang.

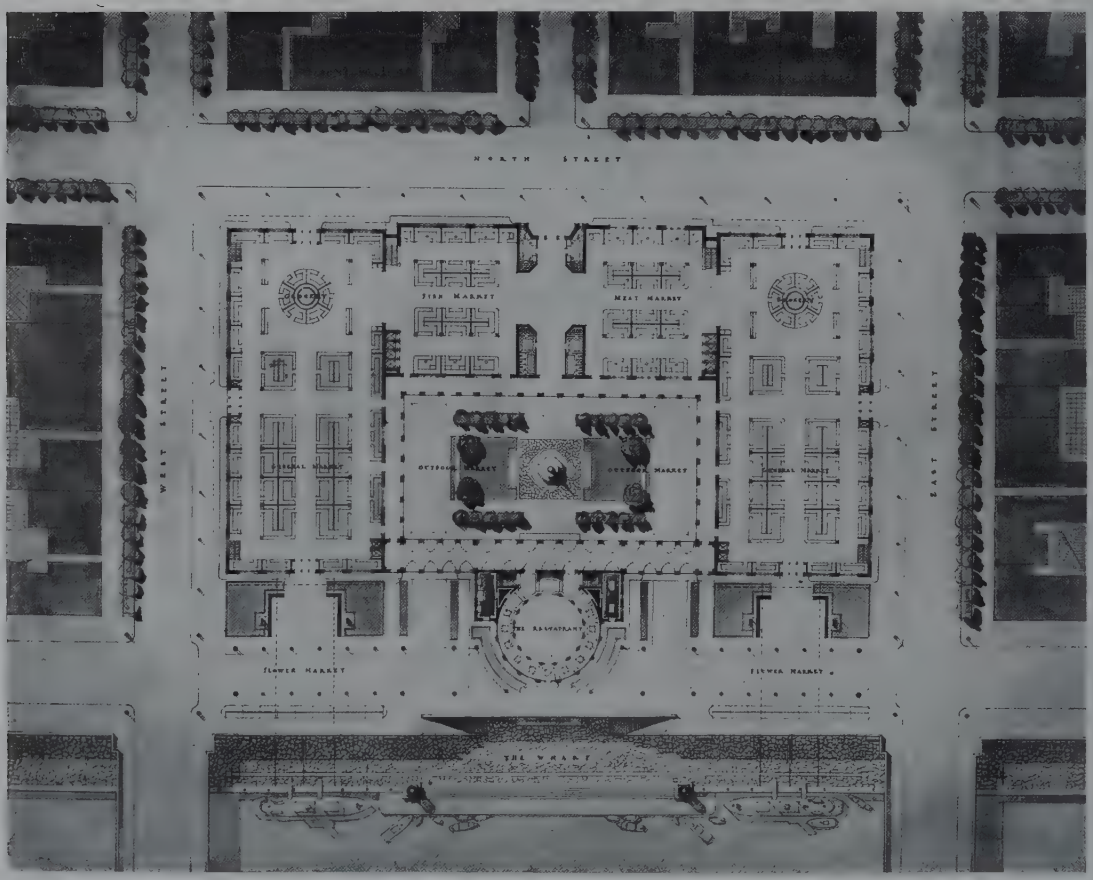

Figure 239. Class A Problem, "A Municipal Market," by T. P. Yang, 1st Prize and 1st Medal, Municipal Art Society.

Figure 240. Class A Problem, Elevation, "A Municipal Market", J. L. Evans.

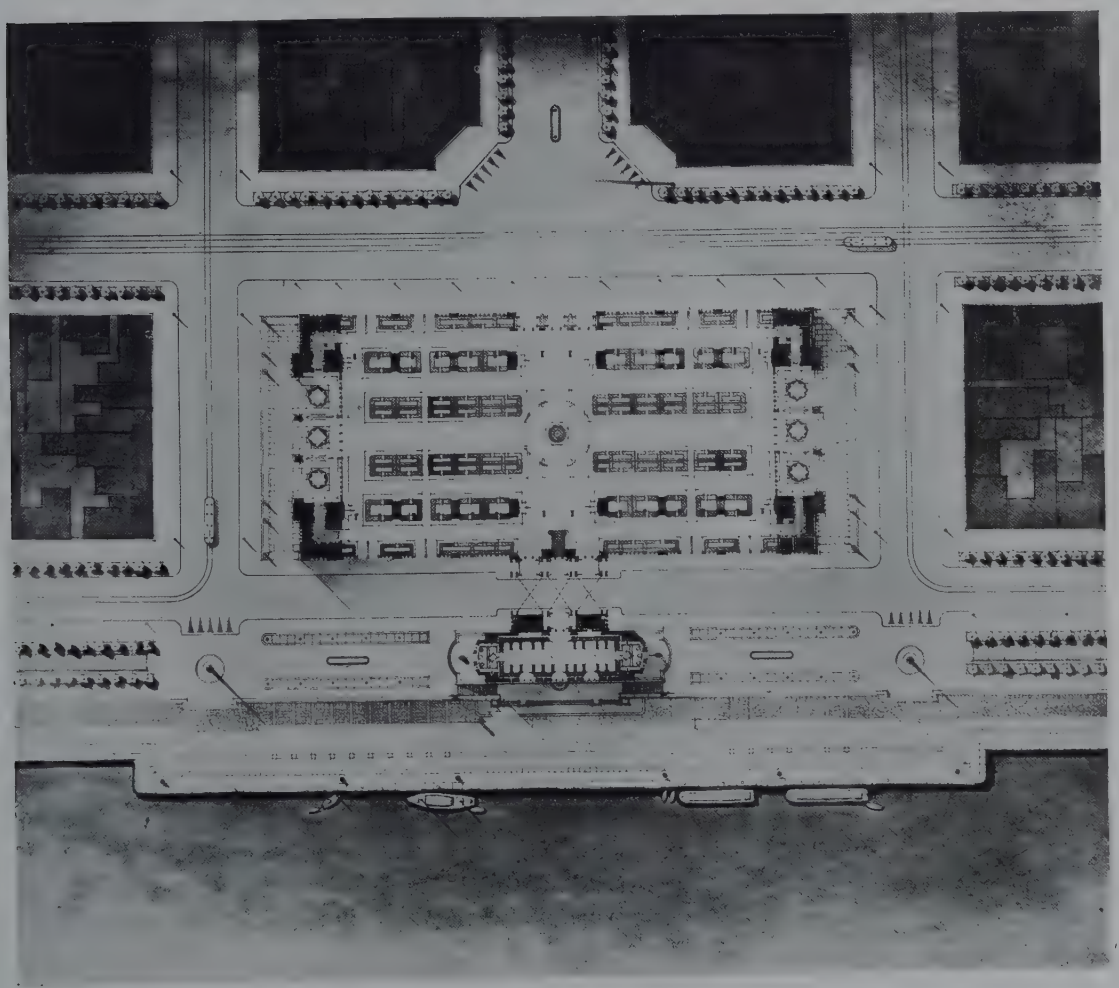

Figure 241. Class A Problem, "A Municipal Market", J. L. Evans.

With the change in program from Class B to Class A, there is an even bigger change in the life of the student himself; the principles on which his actions in the atelier—in the school—depend are absolutely changed.

While working in the analytique he was helped by the upper-class man—sometimes by the man in B plan, but he got most help from the man in Class A. When he was puzzled as to what the critic meant, when he did not know what sheet arrangement to use, or how the shadows should go, or what was wrong with his rendering, he asked the man who knew—who knew because he had been all through this before—the A Class man. And in return he "niggered" for him on his problems.

Now all this is changed. The inexperienced "nouveau" of yesterday, full of enthusiasm but without much knowledge to direct it, has become himself an "ancien"—one who knows. He does not know everything, of course; there is still much to learn; but he knows infinitely more than he did when he worked on his first analytique. He will now have nouveaux to "nigger" on his problems. This will be a great help, of course.

But with it goes a new responsibility. In Paris —at the Ecole—the Patron rarely even looks at the work of the nouveau. He gives his criticism to the "older" men only—the men who have learned enough to be able to make real use of this criticism. And the only help and advice the nouveau gets is from the older men. This system has some good points about it. These "older" men are terribly in earnest, and want the men of their atelier to make good—*for the reputation of the atelier.* So they take this teaching of the younger men seriously. And as there are a number of them they give the benefit of their collective advice, so that a too radical suggestion of any one of them is softened by the average of opinion of the others.

In America the system is somewhat different, especially as to the Patron. Here every student has the advantage of criticism from the Patron. But the clever student soon learns that the more work he has prepared to show the critic, the more schemes he has thought out, whether in plan or elevation—in short, the more *thinking* he is able to show the critic—the more will he get from the critic in the way of constructive advice and suggestion.

And he learns that to be able to put before his Patron these several schemes there is nothing so valuable as criticism from the Class A men. Criticism from those in one's own class is often of use even though much of it comes in the guise of good natured banter.

Now when a student becomes a Class A man he must realize that in his turn he must give this help to his juniors—not with the idea of forestalling the criticism of the Patron, or taking its place, but to prepare for the Patron, to supplement him, for the good name of the atelier and for its *esprit de corps.*

And he soon learns that this help to the younger men, while it is gratefully received and appreciated by them, is of incalculable value to himself. He finds his ideas come more freely on someone else's problems than on his own because he approaches it with a freer mind—one's thinking sometimes gets into a rut on one's own problem, from thinking so long and so hard on the one thing. And he finds when he is drawing or rendering for someone else that his pencil stroke, or his brush stroke, seems more inspired than it did on his own paper, and for the same reason: he is more free—he is not so afraid of spoiling the work of others as he frequently is of his own. He finds he does some of his cleverest work for others.

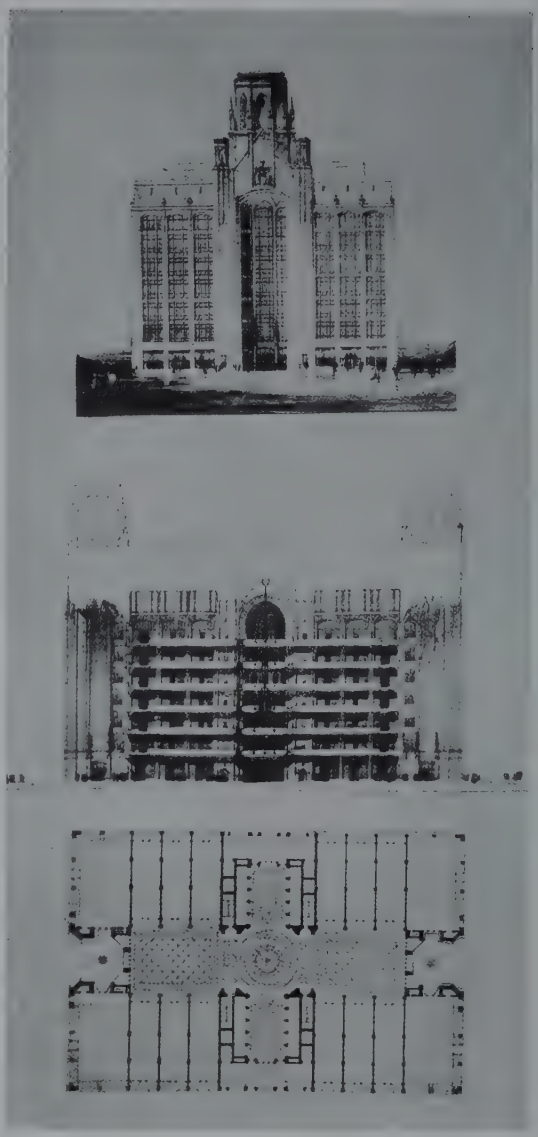

Figure 242. Class A Problem, "A Shopping Center", 1st Medal, by Jesse F. Lauck.

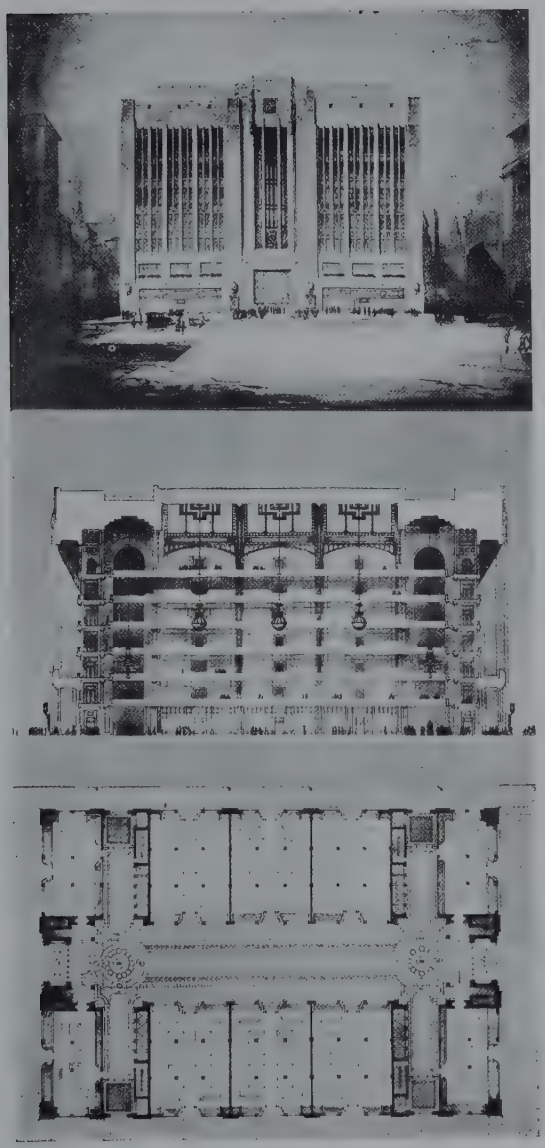

Figure 243. Class A Problem, "A Shopping Center," 2nd Medal, by Boris I. Riaboff.

This is quite natural. In fact, one of the best ways to really learn a subject is sincerely to try to teach it to others. And when he calls on "niggers" for help he must teach them something while they are working for him: he must insist on good work from them, and not accept careless drafting or slovenly work—as if it were charity. The "nigger" gets the full value in learning and experience of what help he gives—especially if the "ancien" tries to impart some of his knowledge during the process.

The Patron knows how to stretch a paper, how to make a rubbing. But his time is too valuable to teach such things to the newcomer, who must learn these and similar essentials from the older men. So, too, he must learn from them methods of studying a problem, something of the contents of the atelier library, the use of mosaic in plan presentation and the different motives of mosaic that have come to have a meaning in plan, just as certain symbols on a working drawing indicate an electrical bracket outlet or a base board receptacle.

In a college where architecture is taught, there are courses in descriptive geometry, shades and shadows, rendering, history of architecture, and so forth. In the atelier the place of all these is taken by the "ancien" with his personal criticism and help —and this teaching is a fascinating thing in itself. The designing of architecture is creation; it draws upon and thrills the emotions as does all creation. To teach others to design is a still higher work of creation—to train an unformed mind to create is one of the noblest things that a human has the opportunity to do. In fact it is this type of the spread of knowledge on which all human progress has rested until recent years. The college and technical school are quite of the modern era in development, and though class instruction is necessary where all are to be given an education, it will never be quite the same as the individual instruction of the atelier, either to student or teacher, especially in any of the fine arts. Some people enjoy teaching, are born with ability for that sort of thing, and do it easily. But whether one has the ability or not, it is part of the "job" in the atelier for the Class A man, and when he wins his medal or his prizes he should not forget that these are given with the understanding that he has done his full share of such work. It is only so that the atelier can succeed and that the Patron is able to put his best effort into the larger questions of design.

This teaching of the younger men has another value to the "ancien." It takes him "out of his rut", and sends him back to his own problem with fresh ideas, and with renewed self confidence, and this is important. And, too, it is reassuring to the Patron, for he knows that if he is unavoidably absent things will "carry on" until his return.

The teaching, too, is almost certain to result in a great increase in one's knowledge of documents, for things must be explained to students, and explanations can be made most intelligible by examples. And if one uses more documents and makes further use of the customary ones a "working vocabulary" of architectural forms is bound to grow in a direct ratio. This knowledge is of the greatest value, because it has become a part of the memory and it will, in turn, be the raw material on which the imagination will feed, and from which will grow creative work.

But whether teaching is pleasant or irksome, whether one takes to it easily or finds it "hard work", it is nevertheless *a necessary part of the atelier system*—a debt that each man, in his turn, owes to those who came before him and gave him knowledge to pass these teachings along to those who follow. Only so can architectural design progress, in the true meaning of progress as a steady growth.

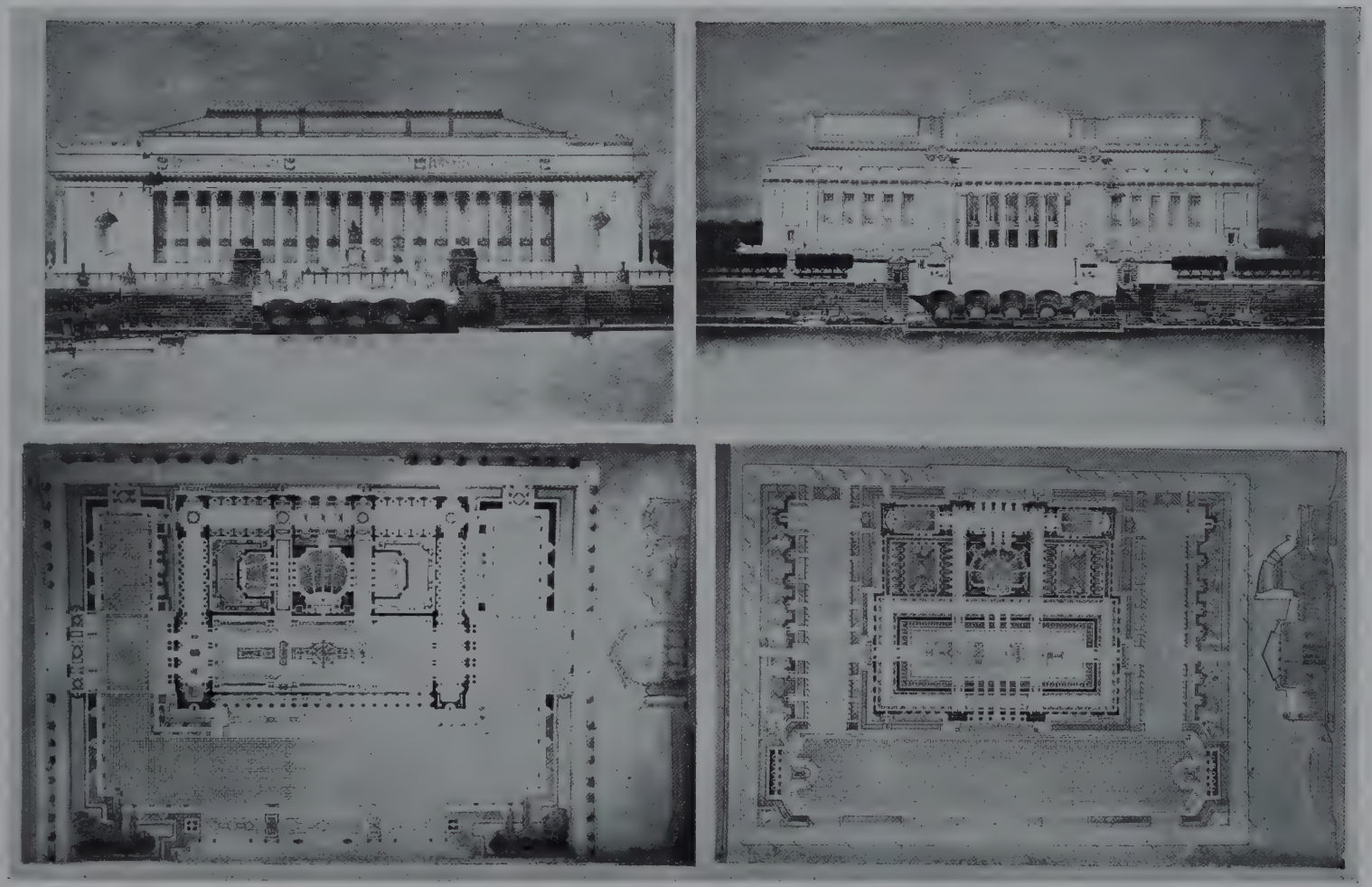

Figure 244. Difference in parti in schemes for A Museum of Applied Science (See also Figures 244a and 244b), Intercollegiate Problem, 1912. The problems of H. L. Shay (right) and J. R. Edmunds, Jr. (left). The latter was awarded the prize. These plans, and those shown in Figures 244a and 244b, will be found valuable as examples for the treatment of entourage.

THE CLASS A PROBLEM

Chapter XXVI

STUDYING THE PLAN PROJET

THE student who has arrived at Class A has had enough experience to formulate for himself a method of study. Each man's method is fitted to his own personality, and differs from that of another because of the difference in personality. But where one has the opportunity of seeing another's way of attacking his work, one often is able to pick up an idea or two to graft on to his own method. For that reason some suggestions as to studying the Class A plan may be of value.

In preparing work for the critic, the Class A man must not be satisfied with a B Class method of approaching a problem. The problems in Class A are big in character—as big as the largest in ordinary practice; only a few in the profession have a chance to work on real problems of the size of those shown in this, and in the preceding chapter. These plans have, sometimes, many parts: the programs give quite a list of "requirements". And just as there are possible very many more "permutations and combinations" of ten different units than there are of five, so there are possible a greater number of solutions to a Class A problem than to the much simpler ones of Class B. If a man is to do well in this work he must be broad-minded enough to look further than the first scheme that comes into his head.

A publication of the medal winning schemes of a projet usually shows that *there are several types of parti* that have been considered by the jury as *worthy of consideration for medals.* In Figures 244, 244a and 244b, we see a number of solutions in plan and elevation for "A Museum of Applied Science"—a problem given in the Class A Intercollegiate Competition in 1912. They were all made from the same program—you can easily find the same "elements" in each—those reproduced were all "placed" and they present quite a variety of thought in the arrangement of these elements. It is easy to see the auditoriums—a large one and two small ones—and their relation to the "circulation" and to the exhibition rooms in each of the plans.

Now in starting to study a Class A problem a man should try to think out a variety of schemes as solutions: for the esquisse, of course; but again, after one parti has been chosen and put down in the esquisse, there is still this need for variety in *trying out different developments of this parti.* Put before your critic these several developments: for each criticism have ready, for him to look at, as many different schemes as possible of the stage of the problem you are studying at that time—it may be the plan as a whole, studies of portions of the plan, schemes for the elevation, for the section, for entourage, mosaic, etc.

One thing it is well to understand. You cannot expect your critic to suggest ideas to you to work out, as an architect in his office would to his draftsman who is working up an office "job". This is especially true in a scholarship competition, or a competition for a prize, and still more so if your Patron has other students taking the same problem. To hold the respect of his students a Patron must be absolutely "fair" to each one of them, and to the students of other Patrons. He will always be ready to appraise what you put before him, and suggest lines of development and improvement. *But it rests with you to originate.*

This means that you must develop a detached quality of mind which will allow you to put a scheme aside for a while after you have thought it out, so that you may try another with a free mind, and after that another, and so on. If there are four elements in a plan, there are quite a number of ways, according to the mathematical law of permutations and combinations, in which these four elements can be differently grouped on one plane. The number is increased if we can put some of these elements over or under others—in a second floor, mezzanine, or basement, for instance. There is possible the same variety in scheme for elevation, section or detail. Have you tried all the possible variations in thinking out your problem? Do not dismiss an idea because superficially it seems silly. On going into it carefully it may prove not so silly as you thought it at first.

It is in this way—by developing a faculty of mind that will allow one to visualize different schemes in succession—that successful designers work instinctively. They are not satisfied until they have tried all the possibilities. In many large offices, in working on an important competition, it is customary to have a number of different designers working, simultaneously, on different solutions of the program. When these have been carried far enough so that all their good points are visible, a judgment is held in the office to determine which of the schemes shall be studied and presented. A competition of this sort is costly—usually one or two thousand dollars being spent beyond the sum given to (unsuccessful) competitors. The only competitions which pay their way in the office are the ones that are won. Therefore, everything is done to try to discover and develop "the winning scheme."

It is necessary for Class A work too, to make a real study of the field of architecture in which the program is taken. If your problem is a theatre, try to see what a theatre is, and how it works—by examination of actual examples, if possible, and also

by a study of documents, whether in books or the architectural magazines. This study will be of more value if some graphic record is made of it. Figures 245 and 245a are notes made in this way by Grant M. Simon (winner of the Paris Prize, 1913). The first was part of a study in hospital design; there were other cards; this one had to do with orientation. The other was part of a study in group plans. These cards having served the immediate purpose for which they were made, were then filed in a classified card catalogue. If the research is carefully made such information is worth preserving and will save a considerable amount of time in studying a future problem in the same field.

In starting to design the new Detroit Art Museum, Paul Cret made such a study, first reading all the publications on the design of museums that could be found (including a series in the *Journal of the Royal Institute of British Architects* that gave the plan of practically every modern art museum, both in Europe and America), sifting the sound ideas from those that might be called "hobbies" of an author, playing off against each other opposing theories, and then putting down the results in table form—tables as to circulations, control, lighting, etc.—and making diagram plans at a uniform scale of all the museums of about the requisite size. Figure 246 is one of these diagrams showing the Minneapolis Museum, as it will be when completed, and the Cleveland Museum of Art, at the same scale. One of the documents studied was the report made to the Boston Museum of Fine Arts by the commission it sent abroad to study the problem for that museum. It is interesting to note that this commission was unanimous in the opinion that of all the European museums for the exhibition of paintings and sculpture, the most successful were

Figure 244a. Elevations of W. Pope Barney, Albert Simons and Frederick Hastings.

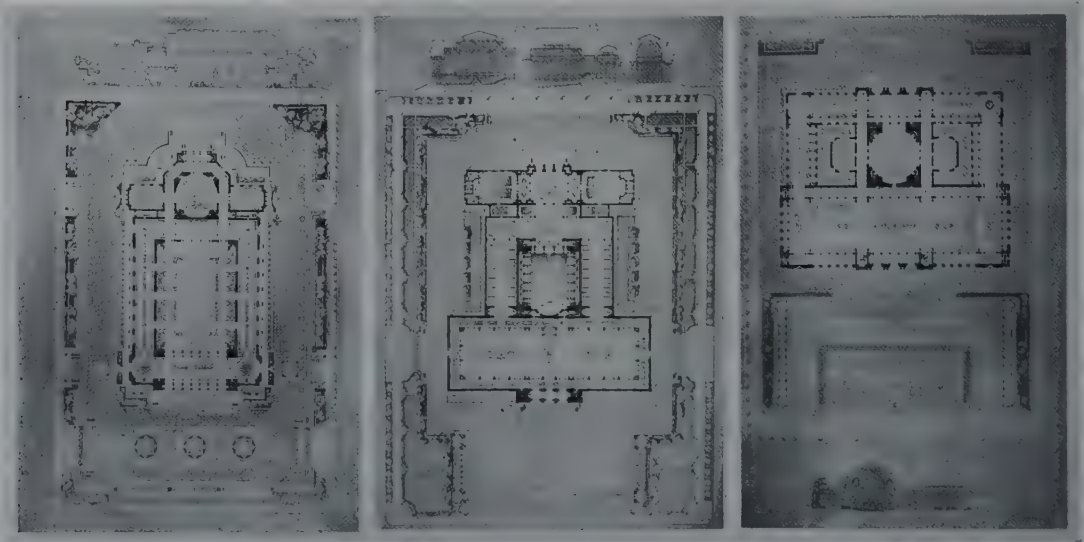

Figure 244b. A Museum of Applied Science. Intercollegiate Problem 1912. (Elevations, Figure 244a.) Plans by W. Pope Barney, Albert Simons and Frederick Hastings.

in every case buildings that had not been built as museums, but were simply converted palaces. Such buildings furnished a background more in harmony with the objects of art than the efficient but cold and formal interiors of the designed museums, where works of art gave too much the impression of being held in storage. It is comments of this sort that open possibilities for new solutions of old problems, that add, in fact, another requirement to those in the program.

There was the same research in starting study in a competition for the design of an auditorium building or convention hall. Figure 247 shows one of the sheets of diagrams so made of plans, all at the same scale. To do this rapidly cross section paper was used. The squares were one quarter inch on a side, and the side of a square was taken to be sixteen feet, so that the plans were at the scale of sixty-four feet to the inch. These studies are not made for the purpose of admiring or copying the examples examined, but to see what there is of value in each one of them that may possibly be of some use in the new problem, and to compare the size of a unit in one with that of a unit of similar use in another.

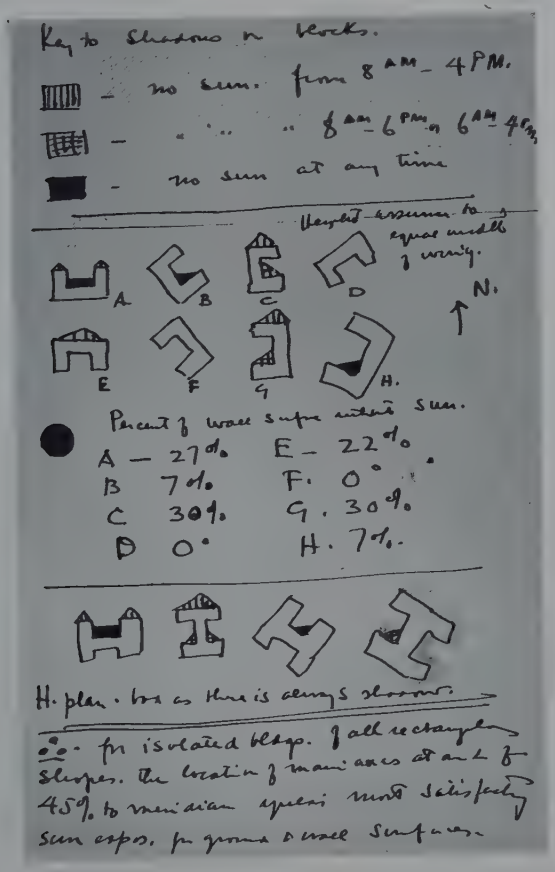
Key to Shadows on Blocks.
no sun. from 8 AM - 4 PM.
no sun at any time
Height assumed to equal width & unity.
A
B
C
D
N.
E
F
G
H.
Percent of wall surface with sun.
A - 27%
B 7%
C 30%
D 0°
E - 22%
F. 0°
G. 30%
H. 7%.
H. plan - best as there is always shadow.
for isolated bldgs. & all rectangular slopes. The location of maximums at an ∠ of 45% to meridian equal must satisfactorily sun expos. for ground & wall surfaces.

Figure 245. Notes by Grant M. Simon, Part of a Study in Hospital Design.

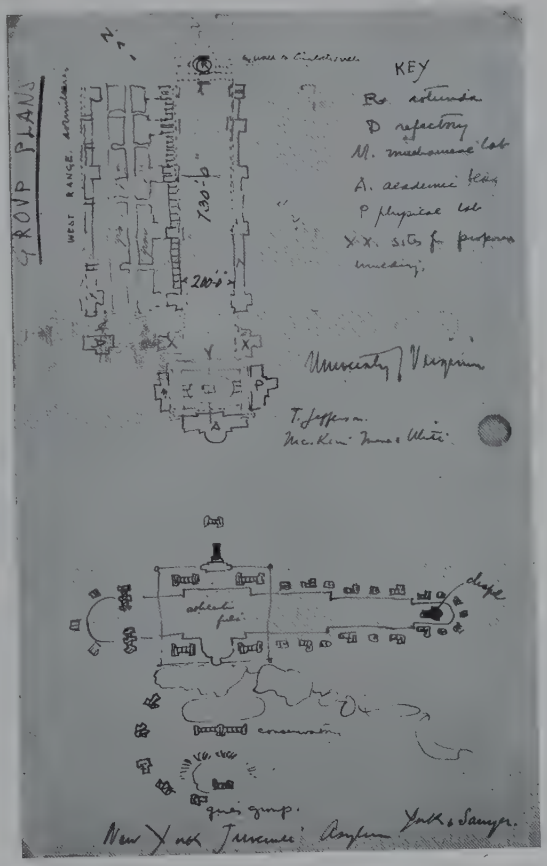

Figure 245a. Notes by Grant M. Simon, Part of a Study in Group Plans.

The appropriate chapter of Guadet's "Eléments et Théorie de l'Architecture" is usually a good place to start such investigation. He takes each sub-division of architecture—the museum, for instance—and goes into the requirements, and gives the historical solutions, usually illustrated with examples from different countries, which gives a good idea of the accepted idea of "character" in plan and elevation of the particular subject. In some fields where the course of modern progress has changed the old ideas—such as the theatre and the hospital—Guadet is still useful for this indication of the desired character.

For these more modern problems it is possible to find in the architectural periodicals monographs on particular subjects, written usually by those who have specialized in them. I call to mind such a series on the Theatre *(Brickbuilder)*, the Hotel *(Forum)*, the Apartment House *(Record)*, the Art Museum *(Journal of the R.I.B.A.)*, and so on.

To be a good designer, one must be a *student*, with all that the name implies. This is true, of course, for executed work also, when one must still be a student,—of surface textures, of moulding profiles, color harmonies, etc., as well as of plan.

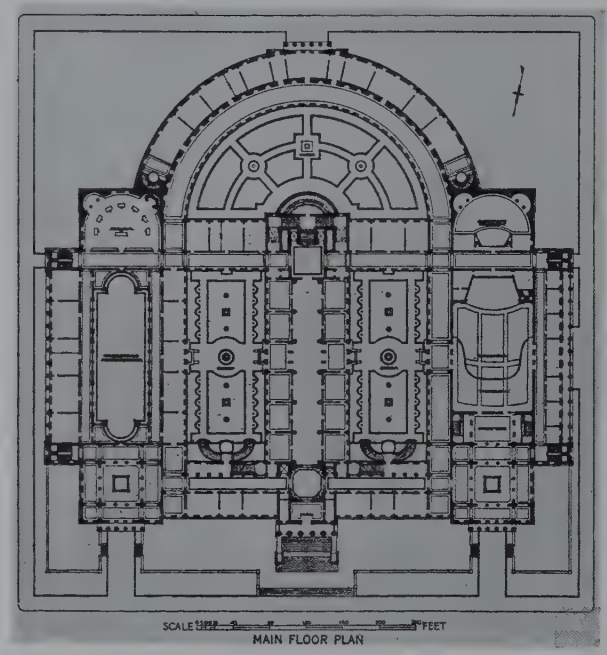

Figure 246. Plan Diagrams, Drawn at the Same Scale.

Above—Minneapolis Museum of Fine Arts. Below—The Cleveland Museum of Art.

Some systematic method of studying a problem is essential—the time allowed is so short, and the problems are so big. To make your work worth-while you must build on what has gone before. Each problem has something new in it—something to be solved for the first time—along with a number of things that have been done before. If you know how these elements have been solved before, you will be able to spend most of your time in finding a real solution for the requirement that is new in this problem.

To know what has been done before, it is worth-while to make some such serious study of parti and poché as was suggested in Chapter XXIV. This is best done between problems, or when a problem is dropped. Take the Grand Prix plans—there is a bound set somewhere in your town—and analyze them diagrammatically, just as pieces of composition, (for this present study) putting down the poché only. A good way is to use onion skin tracing paper and a fountain pen, and though tracing rapidly to try to get the exact size of the poché (Figure 248). It is interesting to see how much the plans sometimes loose when the poché does not have mosaic to "back it up". This is particularly true of the twenty-four hour sketch problems (2nd preliminary for the Grand Prix. Figures 142, 326, 327, etc.), or those in the Labarre competition (Figures 139, 174, 231, 233, etc). Problems done in such a short time have, of course, been studied only hurriedly.

In this study of poché never forget that the poché always encloses rooms. Every break in plan means something, either in structure or in wall treatment, in elevation or section—indicating a pilaster, column or panel, or an arch, beam, vault, etc. Breaks in a piece of poché are reflected in or recalled by similar breaks in the poché directly opposite—an arch or a beam has two ends, for instance, which show in the poché in reciprocal treatment across an axis of symmetry. In this case symmetry is the regularity of that which can be seen from a single point of view. If one side of a long wall has a treatment of pilasters, this is, of course, no reason in itself for treating the other side of the same wall with pilasters, though the other side of the room or corridor would, most likely, have a corresponding set.

This study is made in plan—but the plan is only a symbol of mass in three dimensions. The other dimension must always be visualized when working in terms of the two dimensions of plan.

Another suggestion may be of value. I have indicated that it is always desirable to make studies, trying out as many ideas as one can think of. This means that we must

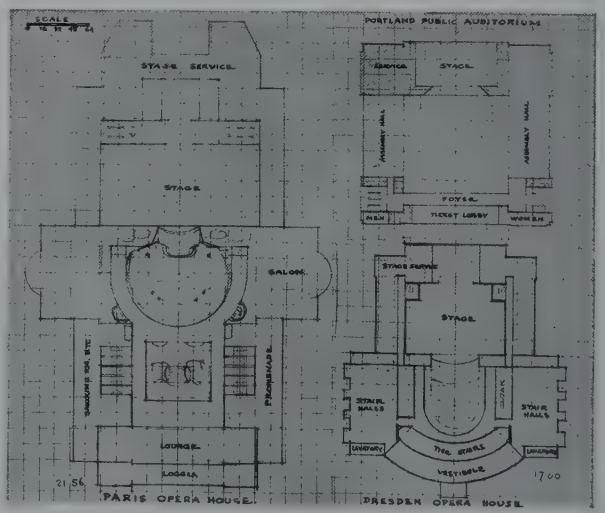

Figure 247. Plan Diagrams for Convention Halls, Drawn at the Same Scale.

Paris Opera House, Portland Public Auditorium and the Dresden Opera House.

use every possible means of saving time. One of these is to use charcoal in laying out many of the early studies. It goes on the paper easily (it can be used very well on tracing paper) and because it can be blended easily, giving almost the effect of a wash, and also because it can so easily be removed, either in large areas with the chamois skin or in spots or thin lines with the kneaded eraser, it is possible with it to get very quickly an "effect" approximating the final effect.

It is possible to make the same sort of study of presentation. The plans shown in Figures 244 and 244b are a reminder of the infinite variety that is possible in entourage, in its composition and also in its detail, and in the forms and use of mosaic. Each of these plans is pleasing in appearance and the space about the building is so treated that the building seems in just the right place on the lot. But take a piece of tracing paper and trace the building outline and the lot line alone, and you will admit that you probably would not have put the building in that position in regard to the lot, had you been doing the problem. Ability to handle a question of this sort is of the greatest value in competition work, for a professional competition and school competition alike, because of the immediate satisfying psychological effect on the beholder.

These are but a few suggestions. Anyone who has his eyes open will be constantly running across ideas that will be helpful in developing his system of study—too many ideas for him to find time to use them all. As we increase our ability in architecture and knowledge of architectural forms, we find opening before us more and more avenues in which to make use of this knowledge, more and more opportunities for expressing the knowledge we have already acquired, more and more problems that absorb and intrigue us because of their many possible interesting developments.

Indeed those who become expert in design find that the difficulty is not "to find something to do", which is the great problem for the healthy small boy, but to keep a sufficiently balanced idea of life so that some part of it may be devoted to recreation, to sport, and to amusement, all of which are so necessary to keep one's mind and body in that state of health and energy that is absolutely essential for continued successful achievement.

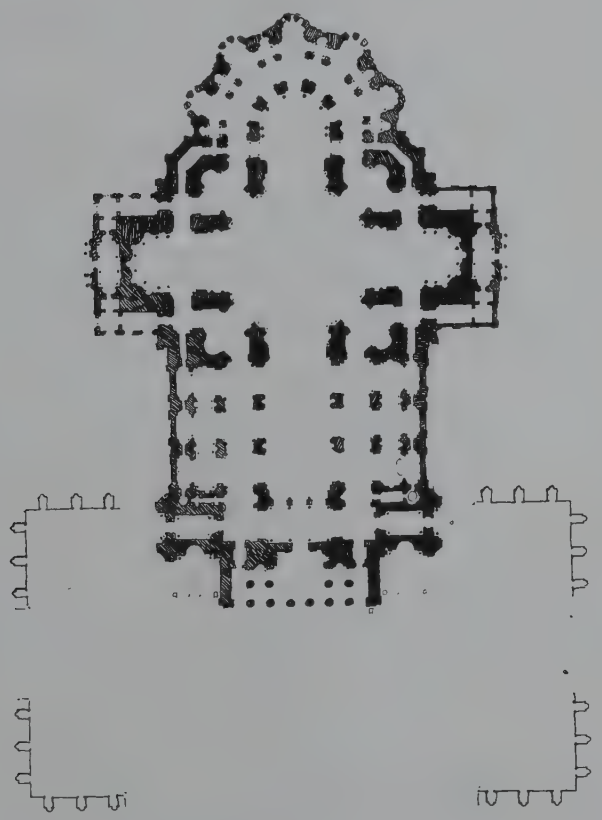

Figure 248. Rapid tracing of poché.
Grand Prix, 1878, Laloux.

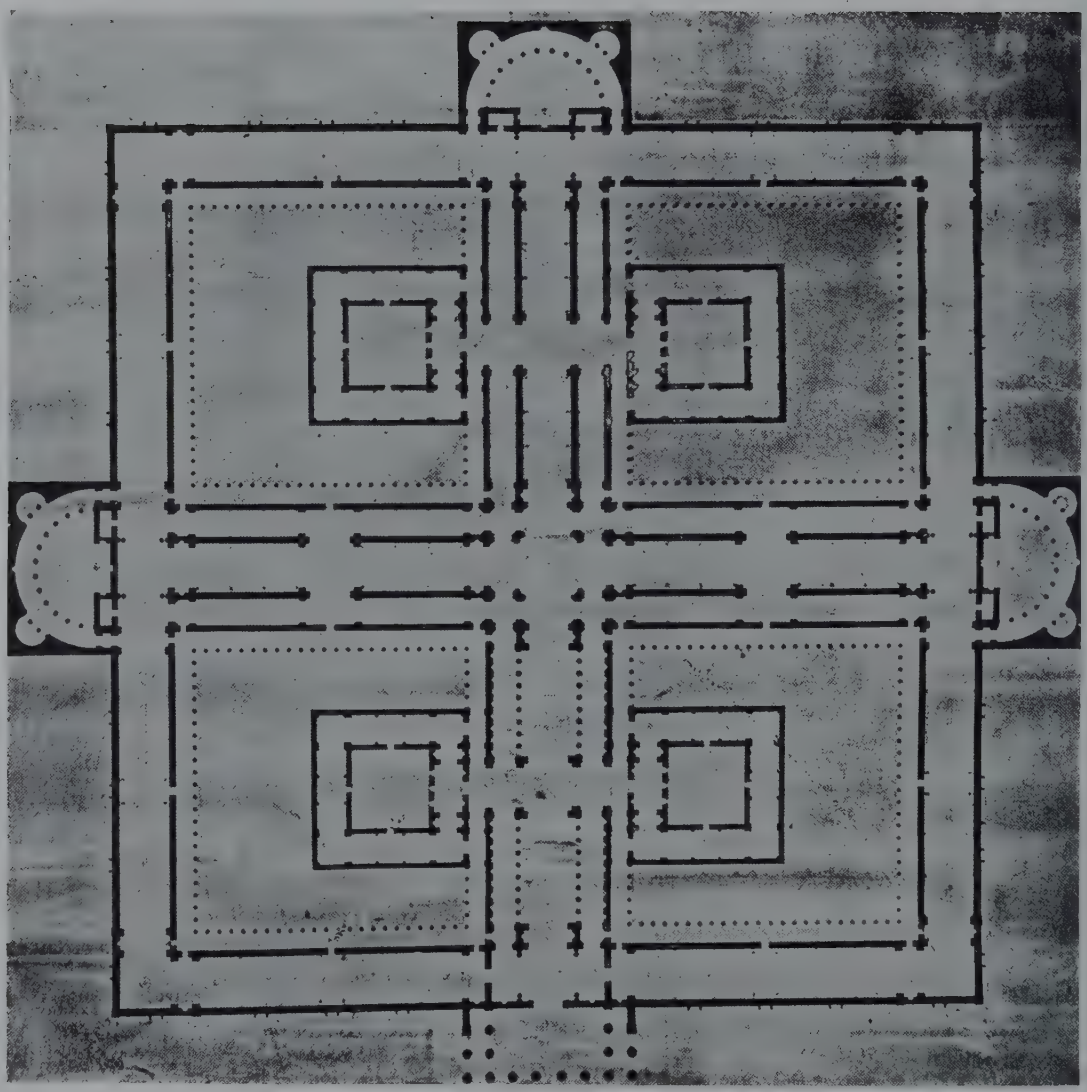

Figure 249. Grand Prix Plan, 1828. A Library for the Capital of the Kingdom (of France). A very symmetrical plan. Bourguignon, pupil of M. Vaudoyer and M. Le Bas.

THE CLASS A PROBLEM

Chapter XXVII

THE "UNSYMMETRICAL" PLAN

WE are so accustomed to feel that training in architecture is all a question of symmetry—starting as it does with the antique orders and their rules of proportion and well defined systems of arrangement—that we sometimes forget that there are circumstances under which a good plan cannot be made symmetrical in the usual sense: i.e., symmetrical on the principal axis.

At some periods in architectural history—as in the later Renaissance in England and the classic revival in France—we find that the feeling for symmetry was so strong that all monumental plans (and many others not monumental in size or use) are forced into a symmetrical shape, whether this is justified by the program or not. Such is the case with many of the plans in the volumes called "Vitruvius Brittanicus", a collection of the monumental architecture of England about 1790-1800. And in the Grand Prix plans of the early years of the last century we frequently see almost absolute symmetry carried out on two axes. Figure 249 shows such a plan—the Grand Prix of 1828—"A Library for the Capital of the Kingdom (of France)." At that time a symmetry of this kind was quite the fashion, and we find museums, hospitals, hotels, and houses all designed in this way in the school problems: four corners exactly alike, perhaps a slight demarcation of the main entrance on one side. In reading the programs of these competitions we find that some of the provisions are very much slighted, or enlarged upon, as the case may be, in the effort for a "monumental" effect, in the manner then the fashion for the monumental.

But there are at times programs which, by their requirements—an unbalanced list of principal elements—call for an unsymmetrical plan; and there are also sites which necessitate an unsymmetrical plan as a solution to a program which, on a different site—especially on a level one—would not call for such unsymmetricality. One can readily see that in the plan of Figure 250, the winning design of a competition for a masonic home in the country, the contours of the property had much to do with the arrangement of the several parts. The contours are shown on this plan: they usually are on competition plans where the site is of large size, unless it is practically flat and level throughout. Of course, in any such "unsymmetrical" plan there are many features and groups of features that are symmetrical about minor axes.

Sometimes a site with many changes of level will yet lend itself to a symmetrical arrangement, the site itself being more or less symmetrical about an axis through one of the large natural features. Such was the case presupposed in Figure 174. This is a school problem and not the result of an actual study of existing topography. It is usually possible in school work to assume at will the details of the natural state of the terrain on which the building is to be put, the only limits being those of common sense and good taste.

The usual reason for the unsymmetrical plan, however, is the program with unbalanced requirements. Several of the best known of the Grand Prix plans are of this character. They are exceedingly interesting and worthy of study; this study will be of the greatest benefit if the program is read when looking at the plan.

A well known example is the "Votive Church at a Noted Pilgrimage Place", by Duquesne, Grand Prix 1897, Figure 251. In this case the site is also assumed as being somewhat unsymmetrical, as it is on ground both picturesque and mountainous, but the program is distinctly unbalanced in the elements required. There are called for, besides the church itself, which was to be grand in its proportions and capable of holding hundreds of people, two sacristies and twelve chapels, and two great establishments, at a lower level and so placed as not to hide or spoil the effect of the church. One of these is a vast shelter for the throng of people who come to be blessed, with an open space and open air pulpit; the other a dwelling for thirty monks, with a large chapter house, a common refectory and services, and small separate lodgings for the monks, each to have a private garden; these lodgings to surround a cloister in the manner of a "Chartreuse". In Duquesne's plan these two dissimilar elements are placed on the same horizontal axis and they are largely made to "compose" with each other by the way in which the road of access from the foot of the hill winds up to the church, which is, naturally, placed on the main axis, at the head of the composition, and by the placing of the fourth element, a group composed of various outbuildings for services of different kinds—lodgings for pilgrims, storehouses, stables. This fourth group has been placed on the same side of the main axis as the *smaller* of the two other and more important elements that have been grouped on the horizontal axis above mentioned. It is interesting to note the skillful treatment of the roadway, strongly "axed" at the turns, but almost lost where it ends at both the upper and the lower levels.

The winning Grand Prix of 1901, by Hulot, "An American Academy at Paris", Figure 252, is an-

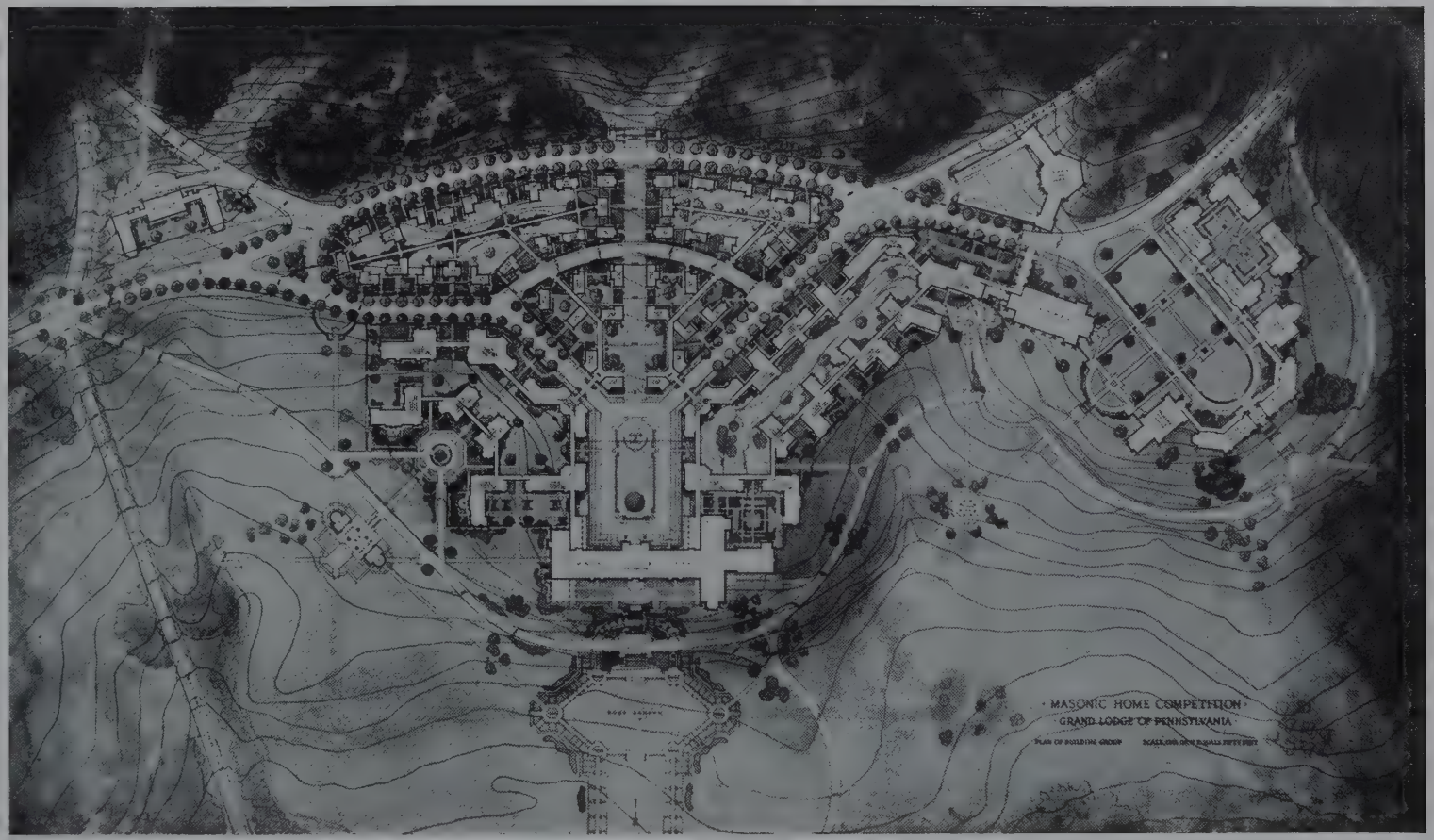

Figure 250. Plan of Design Winning the Competition for a Masonic Home, Elizabethtown, Pennsylvania. Zantzinger, Borie & Medary, Architects.

other well known plan that is unsymmetrical as to the major axis in each direction. This plan has been used as inspiration for many "unsymmetrical" plans: it is a very successful attempt at an unsymmetrical composition. It is also a good document for such a problem as "A Recreation Park", for which it suggests an interesting treatment. Here the entrance to the composition is not opposite the front of the main building, but is at the head of a court between the two larger buildings. These buildings are very unequal in size: the larger of them is placed on that side of the main vertical axis which is the larger in area. There is a very evident division between what might be called the "public" buildings of the group — those to which the public has access at times—and those concerned with the more intimate life of the inhabitants.

On reading the program we find this to be the case. On a gently sloping site, 200 by 400 metres, facing a park, was to be built an establishment, somewhat like that of the American Academy in Rome, where selected students would do research work along scientific, literary, archæological, or artistic lines. There was to be but one entrance to the grounds. There was to be a large building containing all the common services of the institution—like a club house, with dining rooms, and café, lecture rooms, meeting and reception rooms, exhibition room for paintings, sculpture, architectural casts and other objects; a small concert hall, etc. etc. Certain rooms in this building were to be open to the public at times. There was to be another building that must be accessible to the public—the residence of the director and his family—which should serve also for entertaining distinguished visitors, for receptions and other public functions. This building is at the extreme left on the principal horizontal axis. The main vertical axis is taken through the court of honor formed between these two buildings.

The other buildings were to be secluded. Each of the twenty students was to have an apartment in a dormitory building (here placed on the lower edge, on a secondary vertical axis, in two floors) and in addition each of these students, and each of twenty other men of science living in the city, was to have an individual laboratory, or studio, as the case might be. The "outdoor gymnasium", also called for, was here utilized as the open space around which to arrange these buildings of the intimate part of the composition. There were called for, also, stables and coach house, a music pavilion with roofed seating space, and other minor buildings.

It is interesting to note in passing that those placed second and third in this competition had symmetrical schemes.

In 1903 the program for the Grand Prix de Rome called for "A National Printing Establishment". Those placed first and second were *symmetrical*. But that shown in Figure 253, which was placed third, is interesting at this point as another example of a well studied "unsymmetrical" plan. Here again is a division between those parts of the plan to be used by the public and those used solely by employees. The portions open to the public needed only a small proportion of the site but had to be monumentally treated, as they contained a sizable museum for antiquities of the printing art, a meeting or conference hall, and a director's establishment with a large reception suite. The industrial part of the plan takes by far the larger part of the property, but is, like a factory, very simply treated (the "mosaic"—in this case showing machinery—is a good document for mosaic which expresses the character of this plan). Between these two parts, public and private, is placed, very logically, the administration building.

Figure 251. "Votive Church at a Noted Pilgrimage Place", Grand Prix de Rome, by Duquesne, 1897.

It is interesting to compare the plan with that by Donald M. Kirkpatrick which won the Paris Prize in 1912, shown in Figure 254. This was also for a printing establishment, and also called for certain portions to be open to the public—exhibition galleries for ancient and modern presses, manuscripts and printed books. This is again an "unsymmetrical" plan (the long side of the site was the important one) and is very well studied. There is a clever contrast in the mosaic in the two portions.

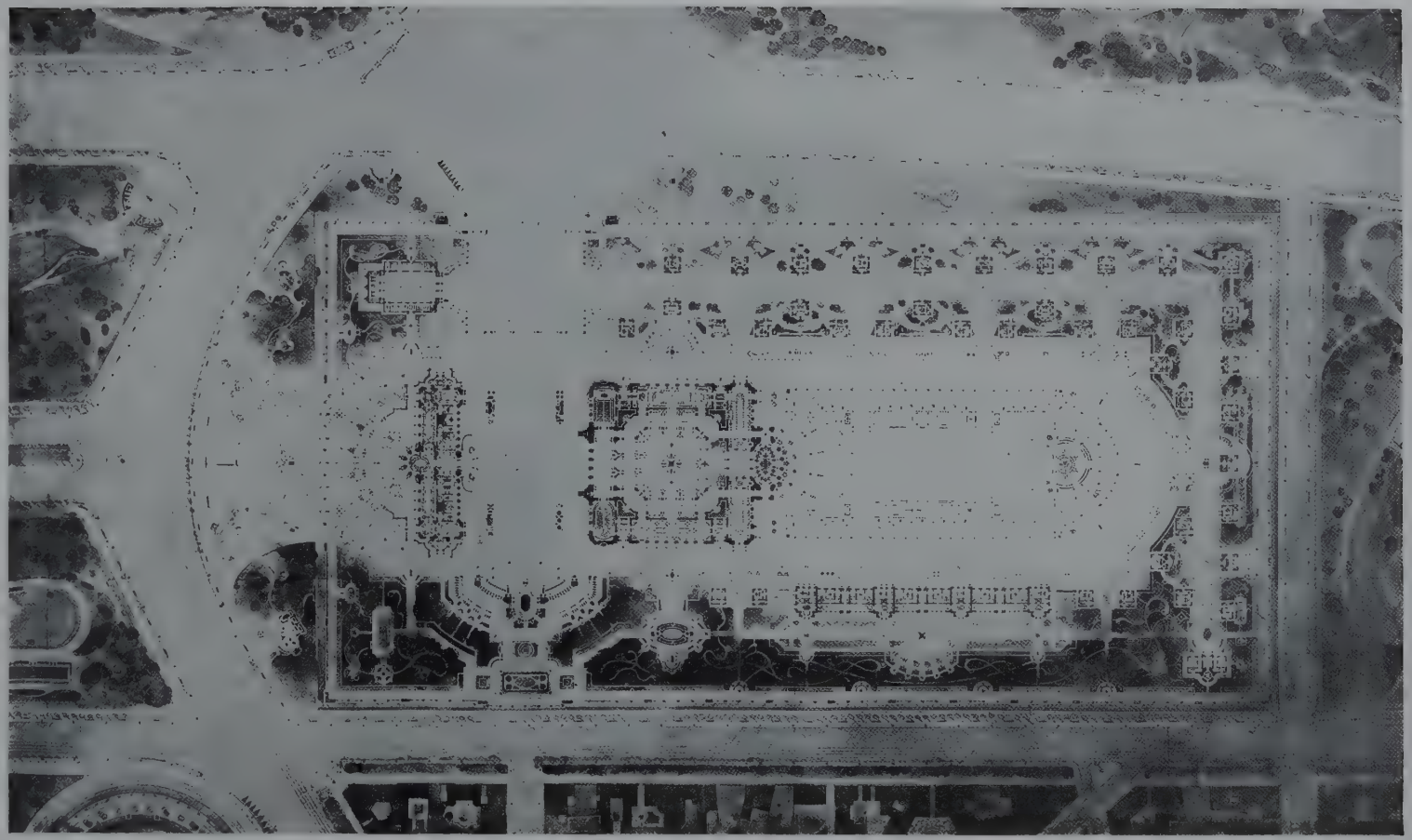

Figure 252. "An American Academy at Paris", Grand Prix de Rome, 1901, by Hulot.

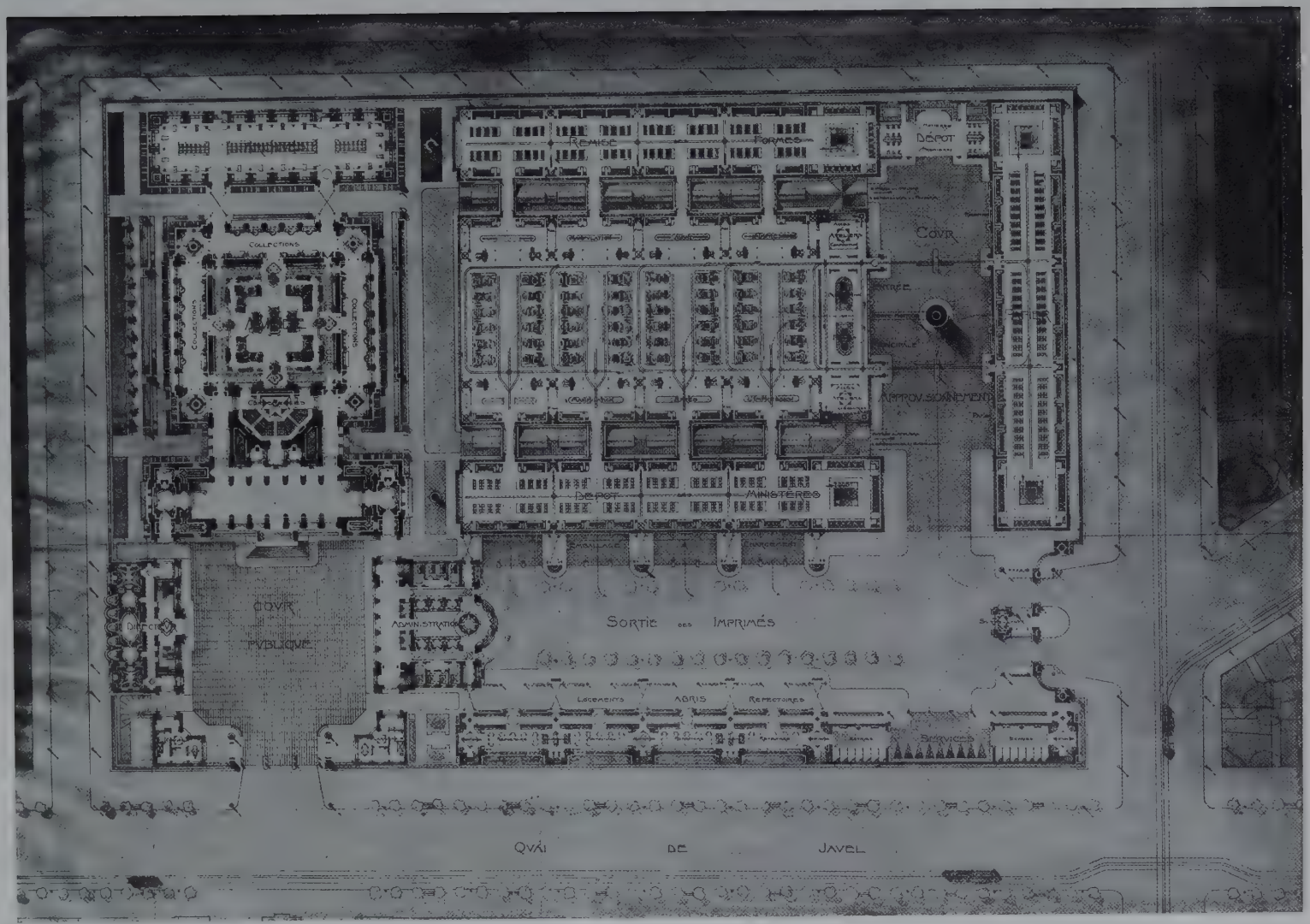

Figure 253. "A National Printing Establishment", E. Coutan. 2me, 2nd Grand Prix de Rome, 1903.

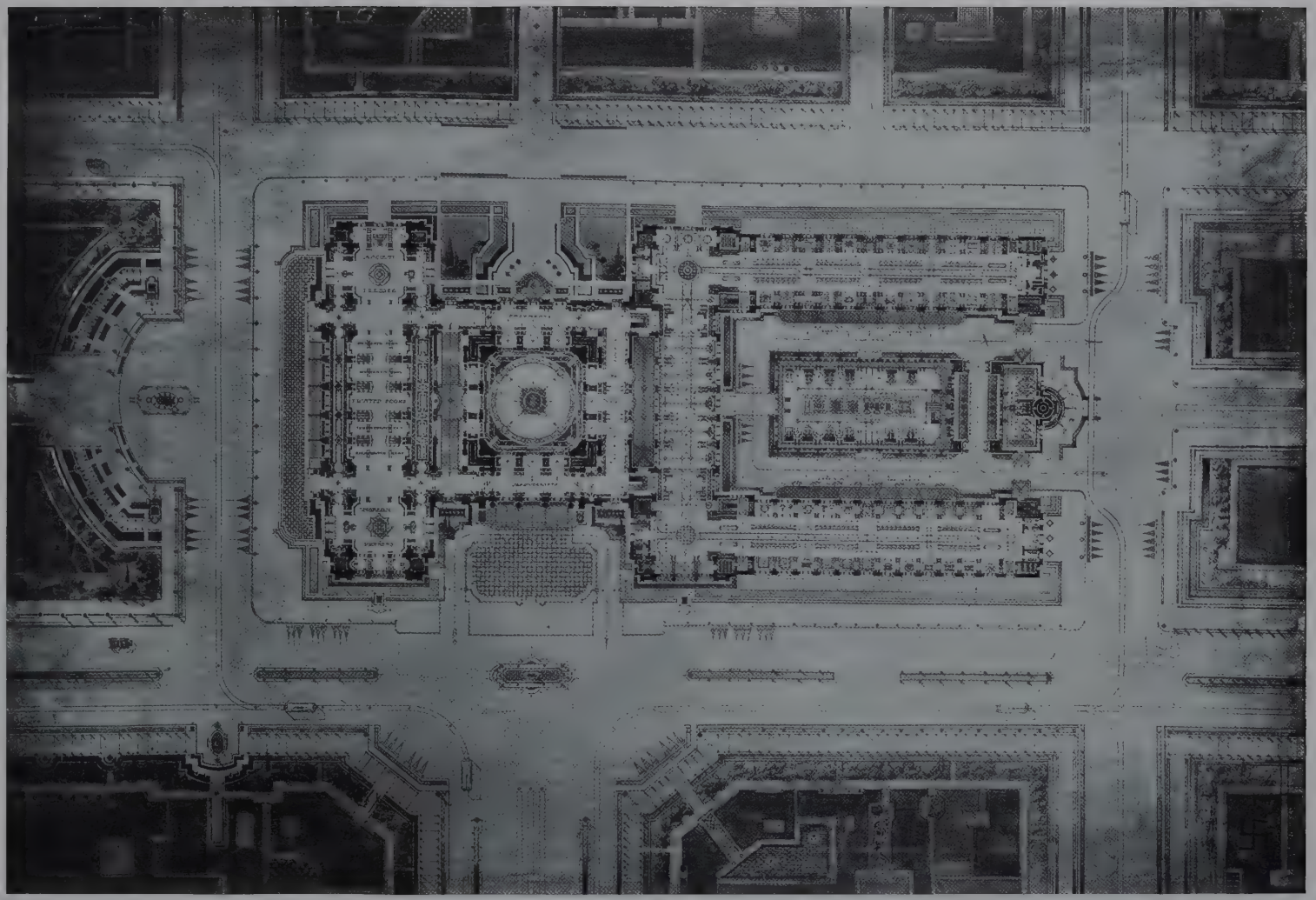

Figure 254. Plan of Winning Design for Paris Prize, 1912. Donald M. Kirkpatrick, University of Pennsylvania.

Figure 255. Elevation, Paris Prize, 1912. Donald M. Kirkpatrick, University of Pennsylvania.

The elevation of this problem, Figure 255, is a good study of an elevation of a single building that is unsymmetrical on its principal front. Many side elevations are unsymmetrical in this fashion, but not often front elevations; and usually the side elevations are not called for in school projets. So this problem frequently first confronts the designer when he is attempting a solution for a building to be built, and without the help of the friendly Patron. These unsymmetrical elevations are, to most people, much more difficult to compose well than the symmetrical ones. The laws of composition on which they depend are more subtle, much less tangible, than those which apply to a symmetrical façade. It is the same sort of a problem as the designing of an automobile, of which the principal elevation—the "side" elevation in this case—has distinctly a "head" or front end, and a rear end; it is an elevation that has direction, and movement.

The Grand Prix plan of Pascal, "A Bank and Residence for a Rich Banker", Figure 257, looks like an actual problem rather than a school one. The site given was an irregular one at the intersection of two streets, which were of unequal importance, and on which the frontage was unequal, necessitating a scheme that must be unsymmetrical to a certain extent. As the building was to contain, in addition to the bank proper and a residence for the banker, a separate establishment for each of two sons, and as one son was married, the other a bachelor, there was to this extent an unbalanced set of requirements. Pascal, however, took two of the requirements which had no similarity and placed them symmetrically on either side of the main axis at the front. These were the main banking rooms, with a large central glass roofed public space, and the stables, which he placed about a court.

The poché of this plan is worthy of study, especially at those places where the direction of rooms has to be changed because the boundary streets are not parallel. In this case circular rooms are used to make this transition, and the odd shaped spaces, which always must occur in a plan of this sort, have been used as light courts, closets, and service space, and do not appear in the "circulations"; i.e. they would not be seen by those using the building, other than the servants and caretakers. The same use of circular rooms to turn portions of a plan at an angle may be seen in Figures 138 and 174. Notice in the latter the two hotels at either side of the center, below the main horizontal axis.

The Grand Prix plan of Bigot (Figure 191), while it is symmetrical in the sense that the two side buildings are about equal in size, is yet very unsymmetrical in the detail of these side buildings, which, from the program, serve very different needs, that on the right being a "casino" with concert halls and game rooms, that on the left the bath house, with swimming pools and dressing rooms. Programs frequently require a balance of some sort between portions of a building that serve very different purposes, as these do here. Usually, however, the uses of the building are not treated as frankly as in this case, and the elevation becomes a screen or mask, similar—sometimes identical—in treatment for the two portions.

But coming back to the consideration of plan, the program, as I said before, will determine whether the scheme is best symmetrical or unsymmetrical. A program with perfectly *balanced* requirements should not be made unsymmetrical in treatment simply to add interest to a plan; and if the program is obviously *unbalanced* in its requirements, the plan should not be forced into a symmetrical mould. Where either of these things has happened, and fixed in the esquisse, it is well to try to find in the site some justification for such treatment, either by uneven or sloping ground—if the program does not specifically prevent such an assumption—or by the treatment of the surrounding territory in the "entourage". The program does not usually go beyond the actual boundaries of the site, further than

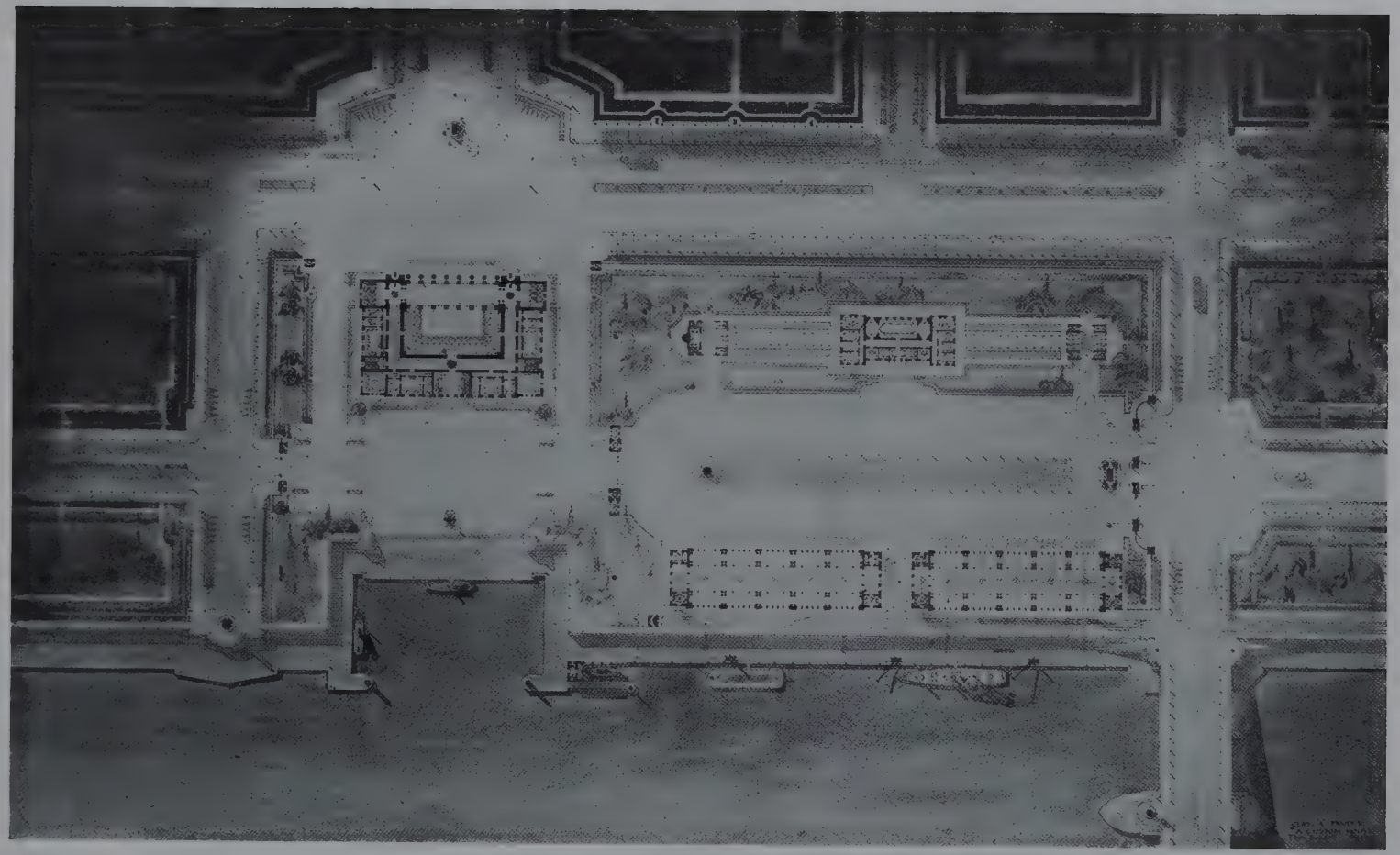

Figure 256. Class A Projet, 1st Medal, "A Custom House," by Thomas Bendell, University of Pennsylvania.

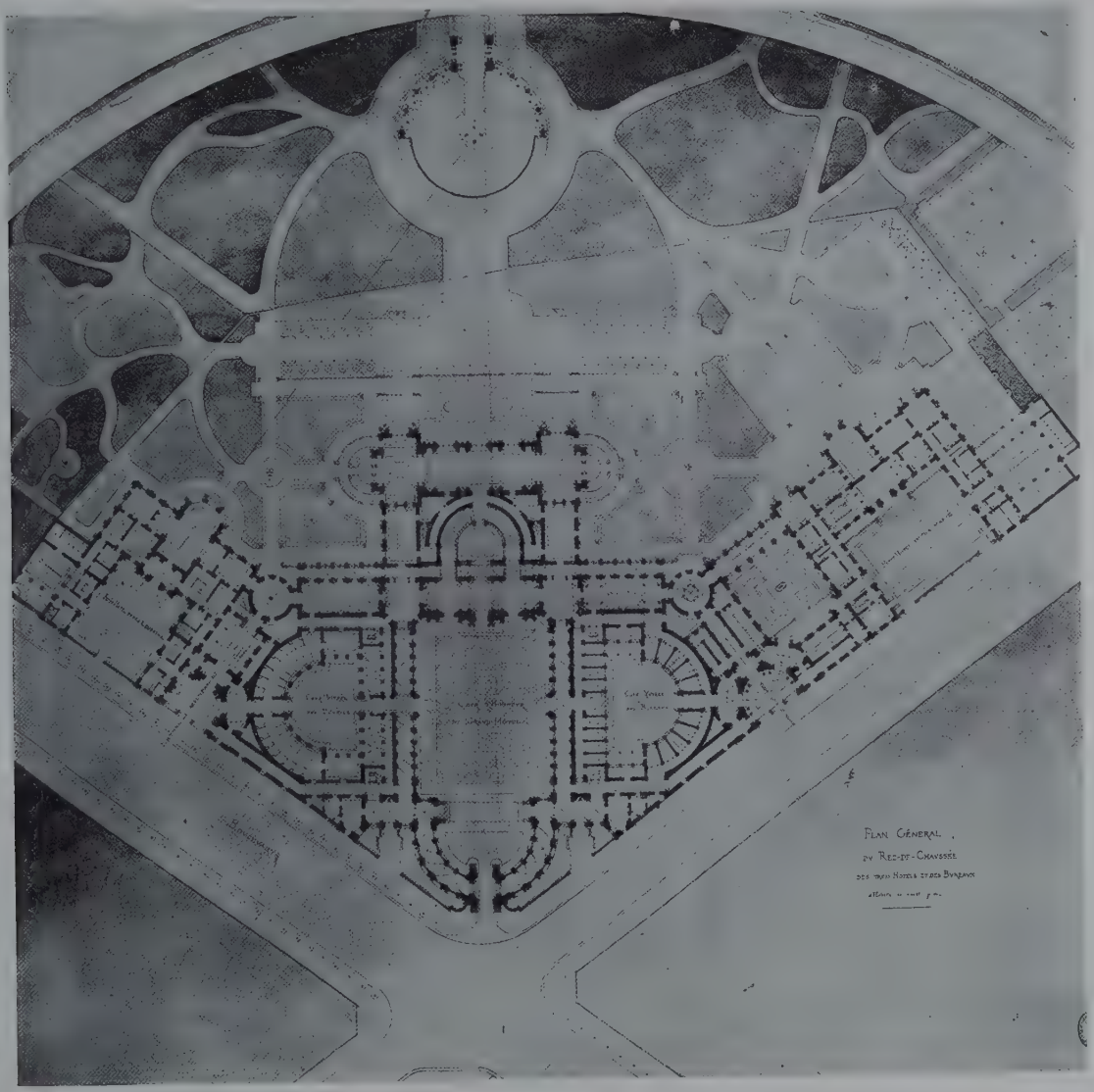

Figure 257. "A Bank and Residence for a Rich Banker", Grand Prix Plan by Jean Louis Pascal.

to mention that one or the other bounding street may be "wide" or "important", so that it is possible to arrange at will the streets running into these (such as the big avenue on the main axis of Figure 254, the similar one at the top of Figure 252, and the diagonal street at the right of Figure 253, etc., etc.) as well as the treatment of the lots fronting on the streets (see the 1914 Paris Prize plan, page XII).

The custom house shown in Figure 256 is an example of a Class A projet with an unsymmetrical solution necessitated by the conditions of the program, which called for free access of all people to the main building, but required that the public be excluded from the working portions of the grounds—warehouses, docks, quarters for the superintendent, etc. There are here the same elements in plan composition as in Hulot's plan (Figure 252) but, of course, treated very simply.

Where the program is such that an "unsymmetrical" plan will give a proper parti, it is undeniably interesting to study. Undoubtedly more difficult to do well than the symmetrical plan, there is consequently the greater feeling of satisfaction on successful accomplishment. A student is fortunate in being able to make a serious study of such a plan under an able Patron during the course of his atelier work. Therefore, if a program appears which seems to have such possibilities, the opportunity should not be missed by anyone who is seeking a thoroughly well-rounded training. He will not regret it later, as many of the competitions in professional practice will prove.

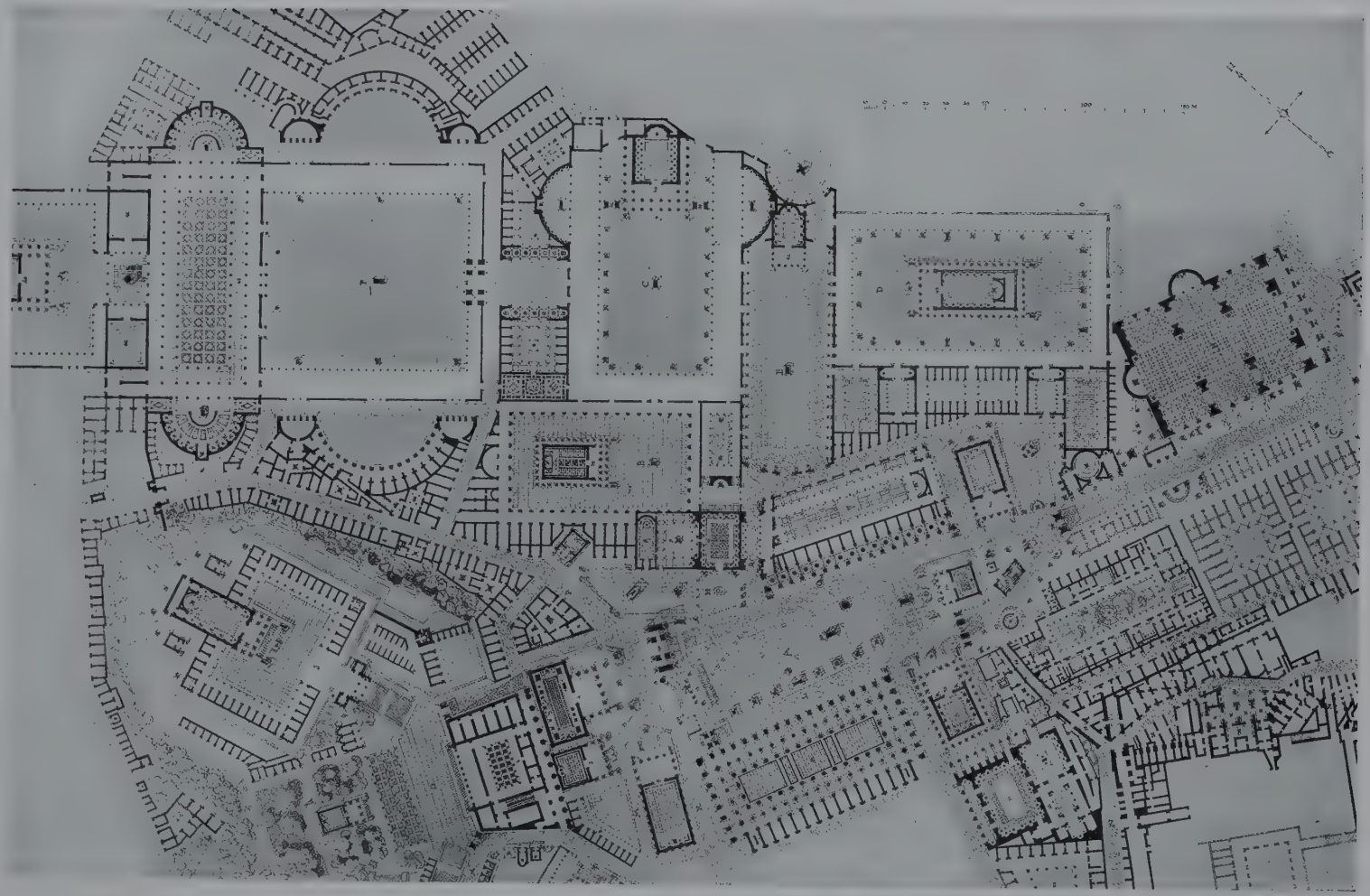

Figure 258. The Forum of the Cæsars and the Roman Forum.
From Gromort's "Choix de Plans de Grandes Compositions Exécutées."

THE CLASS A PROBLEM

Chapter XXVIII

THE "GRAND PLAN"

WE started the study of architecture with very small compositions—portions of a façade, or a very small façade; we might almost think of these studies as composition in two dimensions. Then with the early plan problems we have distinctly a third dimension—a room or some sort of space that requires the study of a plan as well as of a section and an elevation.

We become accustomed to think of a "plan" as the plan of an individual building. Later we realize that there must be a conscious arrangement of a group of buildings; and, further than this, of this group to other groups; the arrangement of cities, and, finally, of cities to each other. The study of city planning is still in its infancy.

In fact, the art of relating a few buildings to each other is not very ancient, if we think in the terms of time mapped by H. G. Wells in his "Outline of History." The Parthenon at Athens, in all its perfection of line and execution, was built without much thought of an arrangement to the site, other than that it covered the spot where a former temple had been burned down by invading Persians. There was no arrangement with the other buildings on the Acropolis, as we think of arrangement today, in terms of axes and symmetry of masses about axes Its faces are not parallel with, or perpendicular to, the faces of the Erechtheum, the Propylæa, or the great statue of Athene. The placing of a temple was governed by political rather than architectural considerations. At this time no one thought of designing more than a single building at one time, at least in Greece; although some of the temples in Egypt, with their several forecourts, one in front of the other, and before these the parallel rows of sphinxes extending for a great distance, give an idea of some understanding of what we think of as group planning.

But our culture, our art, is built on that of Greece. In the development of this culture we find the first realization of the necessity of a comprehensive scheme for the arrangement of the important structures of a city at Pergamos in Asia Minor, which started as a Greek colony and was at its greatest height at about 150 B. C. Pergamos was a halfway house in the transformation of Greek Art into Roman. Here the natural physical features of the site were used to the full in the grouping of the important buildings of the colony—the temple, basilica, and the great altar—along the crest of a lofty and isolated hill semi-circular in shape. The hollow thus formed was used for the amphitheatre, and as a foundation for the design there was built across in front of the theatre, and connecting the two ends of the crescent-shaped hill, a terrace 730 feet long and 78 feet wide on high retaining walls—the first evidence of deliberate composition in the design of *several* buildings. "In architecture it marks a distinct advance. The architects of ancient Greece, perfect though their buildings were, as far as they went, had not arrived at the conception of groups of buildings, linked together into one great architectural design."* This idea of a conscious group plan spread rapidly; it is in evidence in other cities of Greek origin in Asia Minor in their development during the next hundred years.

The Romans began their imperial architecture with such examples in mind, and as this architecture developed they grasped thoroughly the principles of civic design, the essentials of design in "the grand manner". A new Emperor would add a new forum in the imperial city to those built by his predecessors, and new temples, new stadia, new triumphal arches. Each forum had to be complete in itself, and yet be brought into relation with those that adjoined it. In Figure 258 the original forum is lettered A—the "Forum Romanum"—dating from the earliest years of the city, used originally for trading purposes, as a marketplace, and later used for gladiatorial combats. To the north—at B—is the "Forum Julium," the Forum of Julius Cæsar. At C is the Forum of Augustus with the Temple of Mars Ultor at its head. But the most magnificent was the Forum of Trajan, with its forum proper—lettered F—entered through a triumphal arch from the Forum of Augustus, a great hemi-cycle at either side. Adjoining it, to the left, is the basilica, then the two libraries, with the Column of Trajan in the court between them, and, still further left, the temple, of which only the front is here shown. Although the Via Sacra winds through the composition of these groups of buildings and open spaces, we see here evidences of many of the principles used by Le Nôtre and the other architects of the time of Louis XIV in France who worked in what has been called "the grand manner". Here are vistas from one great plaza to another, large semi-circular motives balanced at the ends of an axis, temples placed at the end of an avenue. Everywhere we see conscious arrangement. The two main principles on

*"*The Mistress Art,*" by R. Blomfield, '*Pergamos and Hellenistic Art*,'*

Figure 259. Plan of St. Peter's and the Vatican—The "Leonine City". From Gromort's "Choix de Plans de Grandes Compositions Exécutées."

which the Roman architects worked were, first, the vital importance of symmetrical planning—hemicycle and exedra balanced each other on either side of the court, etc.—and second, that the planning should proceed on main axial lines. Largeness of conception is one of the principal elements of the "grand manner", a certain distinction of mind which rises clear of details to some predominant idea. The Romans of imperial times learned from the first to consider buildings not as units but as parts of a larger scheme—realizing in imagination long perspectives, the grouping of great masses of buildings and their arrangement in a unified design—real city planning. This is a great improvement on the Greek custom of building a single building at a time, without thought as to its neighbors.

This tradition grew and spread wherever Roman civilization spread. To this day every town in Italy, France, and Spain has its "square": not only the big cities, such as Venice, Florence, Siena, Pisa, and so forth, but the small towns as well, and the small towns in the foreign colonies of these countries. In Cuba and Porto Rico, though a town may have only ten houses, it will have its "plaza", usually with the church fronting on it, and where the band plays on Sunday evenings and all the townspeople promenade.

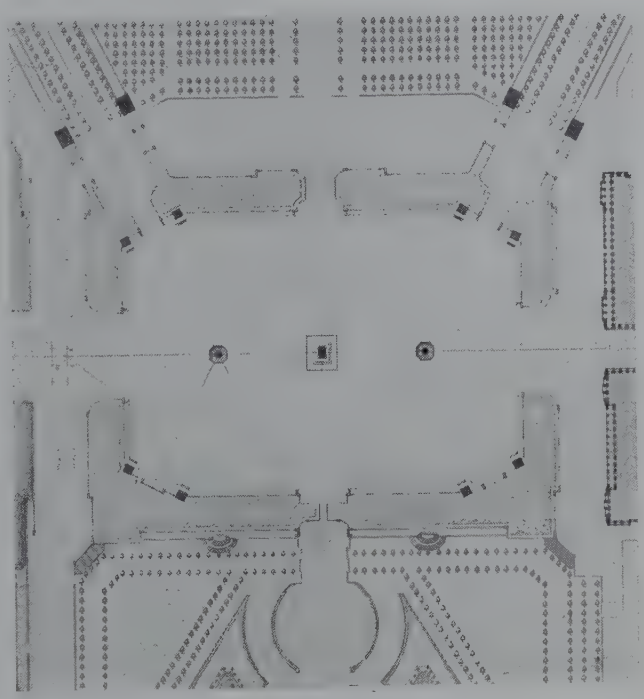

Figure 260.
Plan of the Place de la Concorde.

In the Middle Ages, especially in the countries in which Gothic architecture developed to a great extent, these squares, or plazas, took amazingly irregular forms—were no longer the simple symmetrical shapes of classic times. And yet the tradition was not entirely lost: the cathedral, or church, and the buildings of the civil authorities usually fronted on these spaces and there was often a fine feeling for placing the tower or other feature of a building on the axis of a street. Camillo Sitte, in his "L'Art de Batir Les Villes", has given plans of the "civic centers" of many of these mediæval cities; though at first glance they seem quite shapeless, the more they are studied, the more evidences one will find of a seeking for architectural effect. The irregularity typical of those old plazas is the result of a gradual historical development; the lines are apt to appear less irregular in reality than in the plan, for it is difficult for the eye to pick up even considerable deflections in line.

When the glory of the city of Rome was revived during the Renaissance—and it was at its height from 1500 to 1650 A.D., as the city of those popes who both understood and appreciated the arts—the building of St. Peter's and the Vatican, and the smaller structures that grew around these two, became a study in city planning on a large scale, developing into what would be called today a "civic center", Figure 259. The open space in front of the cathedral was to have been continued out to the river just in front of the Castle St. Angelo. Of this the Piazza Rusticucci was a beginning, but this scheme was never completed.

Even as it is, the Piazza San Pietro is a tremendous forecourt. Figure 193 shows only a portion of it, and no photograph can convey the tremendous scale of its colonnades. Some idea of the size may be had from the small figures around the fountain in the measured drawing of this colonnade made by Hough (Figure 223). The sculptured figures on the balustrade are ten feet high, the balustrade is six feet high; the obelisk in the center is as high as a ten story building. It is out of scale; it is a forcing of scale. But this whole composition was intended to awe man and make him realize the exceeding littleness of a human being, and these huge things certainly do it—not on paper, large elements do not give an impression of size in a drawing, but in execution they always do.

There is in Rome another "piazza", or plaza, that of the Capitol, designed by Michelangelo, which, though small in dimensions, is grand in aspect. This effect is due partly to the value of the beautiful buildings surrounding it on three sides—the fourth side is open, giving a view over the city from the plaza—and partly to the ramps of access and the great stair of the Aracoeli Church.

Figure 261. Plan of Park and Garden of Versailles.
From Reynaud's "Traitée D'Architecture".

But it was the French who became the masters of the "Grand Plan", the French of the time of Louis XIV, with their large estates and formal gardens on a gigantic scale, their public squares and avenues; the French, with their instinct for scale, and for the organic relation between the several parts of a composition. For the big plan is a study in the use of axes and the disposition of masses about these axes so that they "compose" in all three dimensions. Studies are usually made in the plan until a composition is arrived at; it is really a study in "entourage".

One of the fine compositions of the French is that of the Place de la Concorde, (Figure 260) with its two fine buildings by Gabriel (the two symmetrical buildings of which the front only is shown in this plan at the right side, the elevation being shown in Figure 149) framing between them the vista down to the Church of La Madeleine; in the opposite direction is the bridge over the Seine river with the façade of the Chambre des Députés stopping this vista; at right angles to these there is in one direction (at the bottom of the plan shown in Figure 260) the garden of the Tuileries (and formerly the Tuileries palace at the back of it), and in the opposite direction the Champs Elysées—a wide boulevard with the Arc de Triomphe de l'Etoile at the end of it. In every direction a vista—which is another way of speaking of an axis that is long.

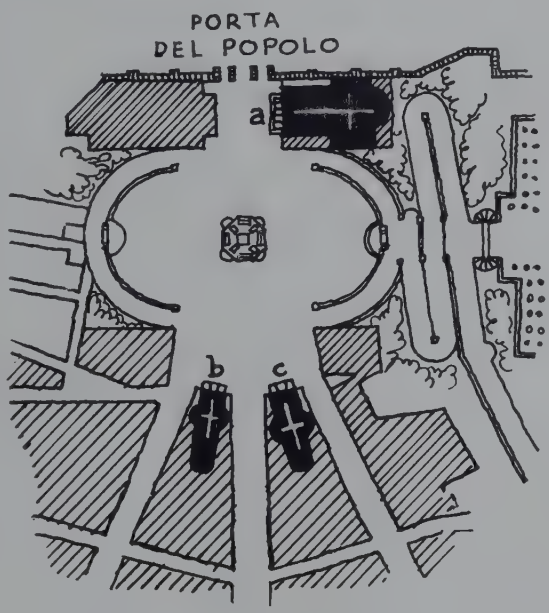

Figure 262. Rome, Piazzo del Popolo
a. S. M. del Popolo
b. S. M. dei Miracoli
c. S. M. del Monte Santo
from Camillo Sitte "L'Art de Batir Les Villes"
amplified from maps of Rome.

The Place Vendôme by Mansart, the Place Royale at Bordeaux by the two Gabriels, the Place Stanislas at Nancy (part of a real city plan), are other examples of the city design of this time. Houses and buildings became details of a comprehensive group; symmetry was used on a large scale. In these French examples we do not find the informality of Italian examples such as the Piazza San Marco at Venice, Figure 128, where (to take one detail to draw attention to the whole underlying attitude), the three monumental flagstaffs in front of St. Mark's stand in a line that is parallel neither with the façade of that church nor with the arcade on the opposite face of the square; nor is it at right angles to either of the sides of the square. The square itself is of so unsymmetrical a shape that any such elemental placing of the masts would have looked awkward. Their positions on the plan had to be determined by eye—a freehand solution rather than one arrived at by instruments. But it is well to remember that this fine square, or group of two squares, for the Piazetta is a part of the composition, and the buildings about them were the work of a thousand years. The Campanile was begun in the year 888, Saint Mark's Church about 967, the Palace of the Doges about 1423, the Library of Saint Mark in 1536, while the building closing the narrow end of the plaza opposite St. Mark's was built as late as 1810.

There was never a necessity for this sort of design among the French in the time of the great Louis. Architectural design had become a science, as well as an art. And though the civic compositions of the architects were such as no country has since improved on, it is in the gardens and estates that we find the most impressive plans. Here the designers had immense sites at their disposal, without previous buildings to hamper them, and with almost unlimited sums of money to work with, thanks to the taxing power of the kings.

Of the many estates laid out and built at this time, the most conspicuous was that of the royal palace of Versailles, Figure 261, designed by Le Nôtre, the greatest of the French garden designers. It is a beautiful piece of academic planning, making use of parterres, terraces, trees planted in rows and in masses, water in fountains and in pools, as well as in a large pool gigantic in size, being a little over six thousand feet in its greatest dimension, the cross arm three thousand two hundred and fifty feet across. Here there are vistas everywhere. In front (see the enlarged portion of the plan shown in Figure 283) are three big avenues leading away from the palace forecourt, one of them the road to Paris. It is said that this arrangement of the forecourt and three avenues was inspired by the Piazza del Popolo in Rome (Figure 262), where the two famous churches by Domenico Fontana and Bernini are in the position occupied in the Versailles plan by the two horseshoe shaped buildings for the royal stables. Compare these plans with the upper portion of Simon's Paris Prize plan for the lower end of Manhattan Island, Figure 171, for which they were the inspiration. Figure 183 shows an airplane view of this portion of the Versailles plan. In these cases the vistas are framed by streets.

Figure 263. Map of Paris. From "Les Promenades de Paris," by Alphand.

Figure 264. "Arc de Triomphe de L'Etoile". From "Paris Vu en Ballon".

Figure 265. The L'Enfant Plan of Washington, D.C., as developed by the Senate Park Commission of 1901. The Capitol at the left, and the Lincoln Memorial at the right of the main horizontal axis, the Washington Monument at the crossing of the axes, the White House below.

In each of these examples there is the same three-fold opening concentrating three long vistas into one point of departure. At Versailles, looking toward the palace, the receding courts are impressive, giving the effect of a deep stage, with the statue of Louis XIV in the focal position.

On the garden side of the palace are more vistas—vistas everywhere, many of them through rows of clipped trees, sometimes set wide apart, with a sun-lit space between, sometimes set close enough to over-arch above. At the ends of vistas are fountains —in one case a "château d' eau"—or statues, or small garden pavilions. This one garden of Versailles, in all its details, would furnish a very complete vocabulary for use in designing formal gardens. It is but one of many fine ones carried out at this time, for each king and feudal lord, each noble, and many of the untitled landed proprietors tried to make his copy, large or small, as his means dictated, of the garden of Versailles. The king even copied his garden himself and made small compositions for court favorites or for his own retreat when he felt bored with court life—Marly-le-Roi, Louveciennes, the Trianons and others. These smaller examples show the same appreciation of the "grand manner"; the same use of axes and vistas. There is a feeling of dignity, a feeling for architectural effect, irrespective of size.

This tradition of garden design—or rather of architectural design on a large scale—has influenced all later compositions, and is today the basis of garden design on a large scale—and of city planning.

Modern city planning dates from 1853, when Georges Eugene Haussemann became prefect of the Seine, and, on the authority of Napoleon III, began to practically re-design Paris and lay out its system of boulevards, cutting new streets and widening old ones, and opening up great spaces in order to disengage monuments of beauty and historic interest. It was he who created the diagonal thoroughfares in order to shorten distances and also to give picturesqueness to the street system by the creation of those acute-angled lots which the architects of Paris have known so well how to utilize.

To his street system others have been added, notably the outer circle of boulevards on the ground formerly occupied by the fortifications, but the plan is in the main as he designed it, with its system of radiating and intersecting avenues placed in such direction as to facilitate traffic (Figure 263).

These avenues in his plan are lined with rows of trees and at the intersections he formed "rond-points", or circular open spaces with an island in the center, around which the traffic rotates—continuously, in one direction—and on which is frequently placed a monument, statue or rostral column.

The best known of the monuments so placed is the Arc de Triomphe de l'Etoile, the triumphal arch dedicated to Napoleon I (and under which France's unknown soldier of the last war is now buried). This is on the Champs Elysées, the most widely known avenue of Paris, where it meets the Avenue du Bois de Boulogne, Avenue de Wagram, Avenue Kléber, Avenue Friedland and several others. The effectiveness of this arrangement is well shown in the airplane view, Figure 264.

This composition about the Arc de l'Etoile has been criticised by students of city planning because, there being so many radial avenues, no sites are left giving adequate wall space on the "place"; the effect of a frame is ruined by so many penetrations. For it is the façades of the surrounding buildings which make the design of a place, not the streets or pavements, which do not stand up enough to count in the perspective. Haussemann was an engineer, not an architect, and was primarily concerned with traffic conditions—especially to facilitate the movement of troops,—and sanitary and practical considerations, rather than æsthetic ones.

Features as well as the general idea of the Paris plan have been copied for most of the European capitals and many smaller cities. The plan for the city of Washington, as developed by the Senate Park Commission in 1901 (under the guidance of Daniel Burnham) from the original plan laid out by Major L'Enfant in 1791, is based on the same principles of city planning. Here wide diagonal avenues are imposed on a rectilinear system of streets. These diagonal avenues converge on focal points designed to be the location of public buildings, statues, or monuments. It is this plan which has made possible the setting the Lincoln Memorial now has; and the "Mall", the long garden between the Capitol and the Lincoln Memorial, will be, when completed and lined with public buildings, one of the fine vistas of the world. Philadelphia, with its "Parkway" from the City Hall to the Art Museum, at the entrance to its extensive park system, is creating a similar fine avenue, a real piece of planning on a large scale. This Parkway was originally conceived as part of the "city beautiful" movement, and was advocated by the various art organizations, as being worth the large cost necessary to condemn and clear the ground—which at one end entered the city's business center—simply from the standpoint of civic beauty. Since the thoroughfare has been opened, however, it has become an exceedingly important motor artery and has justified its cost on utilitarian grounds. The streets of Philadelphia, with two exceptions, are quite narrow and entirely unsuited to the demands of modern traffic. If this large avenue had not been planned and carried through by the art organizations, the Chamber of Commerce and business-men's-associations would now be demanding a motor artery to relieve traffic congestion. And already the need of other highways of this sort is becoming apparent. Usually plans for the improve-

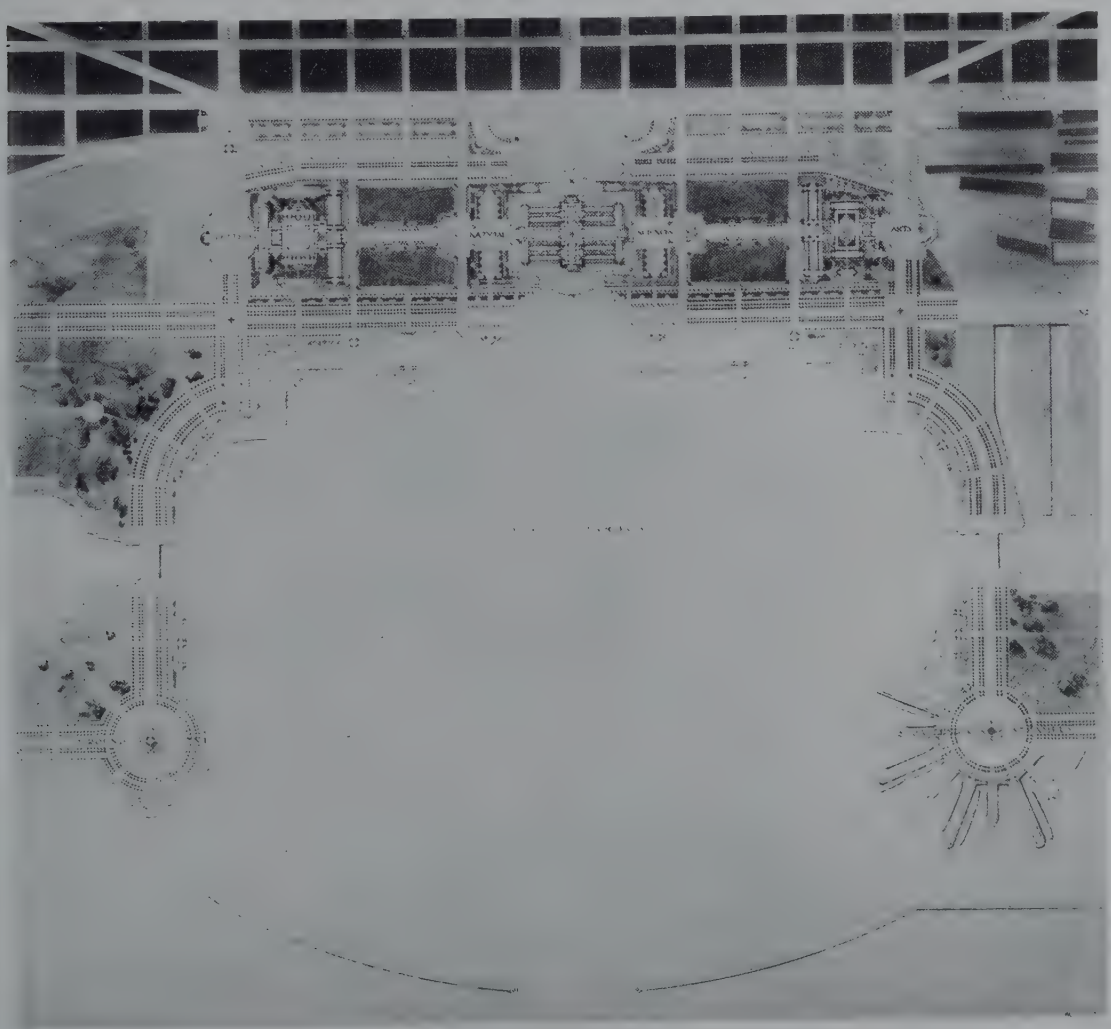

Figure 266. Plan of Grant Park and the Yacht Harbor, as planned by a commission of experts for the Commercial Club of Chicago. From "The Plan of Chicago".

ment of cities are made to accommodate the needs *of the present.* The future is seldom planned for, or, if thought of at all, on a very inadequate scale. And plans of buildings are most often studied as isolated problems, not as parts of a larger problem.

In 1909 Daniel Burnham and Edward Bennett, architects who had already had extensive experience in city planning—the Chicago World's Fair, Washington, San Francisco after the fire, Manila, etc. — undertook a study of the needs of Chicago for the Commercial Club of that city. This study was most thorough and led to a complete plan for the future development of thoroughfares, the arrangement of the railroads and railroad stations and other means of transportation, of the park system and of the placing of public and semi-public buildings. In this case the future was thought of, and planned for. As Chicago was even then a city of over two million inhabitants and the plan as suggested was to care for the growth of a century or more, the survey was a gigantic task, tremendous in its scope. A small portion of this plan, the arrangement of Grant Park and the yacht harbor, is shown in Figure 266. It was proposed to group at this point various buildings, forming a center of arts, letters and sciences, connected by boulevards to other parts of the park system. All the details have been interestingly studied, and though this study is based on existing conditions the method of approach has been rather that of the school problem; i.e. existing arrangements were not allowed to mar the solution in any of its details. The advanced school problem, such as the Paris Prize Competition, is, in fact, the only adequate training one can undergo to be properly equipped for a task of this kind.

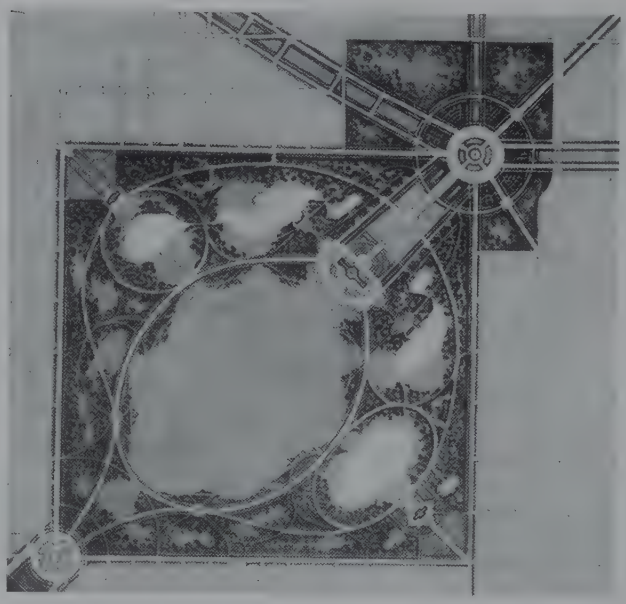

Figure 267. Plan of a park proposed at Western Boulevard and Garfield Boulevard, being an extension of Gage Park, Chicago. From "The Plan of Chicago".

The new parks proposed in this plan are also worthy of study because of the clever contrast of open spaces for playgrounds (as in the center in Figures 267 and 268), with wooded areas; the contrast between straight paths and curved and winding ones, the exquisite way in which these winding ones are arranged, and the use of water, either river or pond, in the composition. These two parks are exquisite pieces of design, exquisite in their paper representation, but giving promise of being equally satisfying in actuality. A typical playground park is shown in Figure 269. In this case the playfield in the center is surrounded by an artificial stream, bridged at the four corners, leaving the outer rim of the park, except for the swimming pool and open air gymnasium at one end, to remain as a wooded park with a drive through it as well as a path for pedestrians.

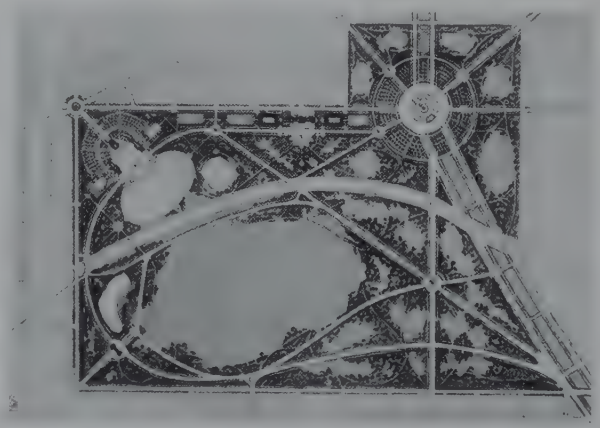

Figure 268. Plan of a park proposed at the north branch of the Chicago River and Graceland Park, Chicago. From "The Plan of Chicago".

The plan of a "world's fair" is a "grand plan", and is generally attacked much as is the school problem; for usually the site is bare, often flat, and as the buildings are of a temporary construction, costs do not interfere with a proper solution to as great an extent as in permanent planning. The St. Louis Fair, the San Francisco Fair, the Pan American Exposition at Buffalo, all are good documents for the arrangement of

buildings in a big composition. Perhaps the finest of these exposition plans is that of the Paris exposition of 1900, inasmuch as it lined the banks of the Seine, and added to the formal compositions about the big courts in the Champ de Mars and elsewhere —the more picturesque groupings along the river—the Seine being of just such width that one bank could show most effectively from the other. Philadelphia in 1926, had a similar opportunity to make use of the banks of the Schuylkill River for the Sesqui-Centennial Exposition, the river being about the same width as the Seine, and winding in much the same way. Such a plan was suggested, the formal groups of buildings to be on the Parkway previously mentioned. But the authorities, with little perception of beauty, but willing to make decisions on matters of this nature without calling upon the advice of experts, passed by this opportunity and placed the exposition in a marshy, flat land without natural beauties.

The campus groups of many American colleges have become studies in group planning; some of them, such as that at Berkeley, California, on a very large scale. Many of these plans have been designed for buildings in the "Collegiate Gothic" style, but their plans, nevertheless, are designed on classic lines, with due regard to symmetry about axes, and vistas from one element to another, rather than on the principles of Gothic compositions.

School plans have, of course, used such contemporary examples and examples of past times as documents. The Grand Prix plan of Jaussely—"A Public Square", Figure 138—is a successful attempt to group a number of buildings so that they compose with each other and with the space left between them by streets arranged to handle the traffic about the entrance to a great bridge; we find here the same search for "vistas" and the same use of axes of symmetry that characterize the plans of Le Nôtre and the architects of the time of Louis XIV.

The Paris Prize of 1914, "A City Hall for a Commission Form of Government", won by Harry Sternfeld (see page XII), is another example of a plan in "the grand manner". Here the program called for a central building for the executive and for some of the more showy phases of government, this building to be surrounded by others of the office-building type which should house the departments—Public Works, Public Safety, Finance, Health, Commerce, Highways, etc. Here again we find the same study of composition on the axes lines, the arrangement of each part of the big plan so that it will look well in relation to the surrounding parts and to the plan as a whole. The plan of the main building is a beautiful study in poché and mosaic.

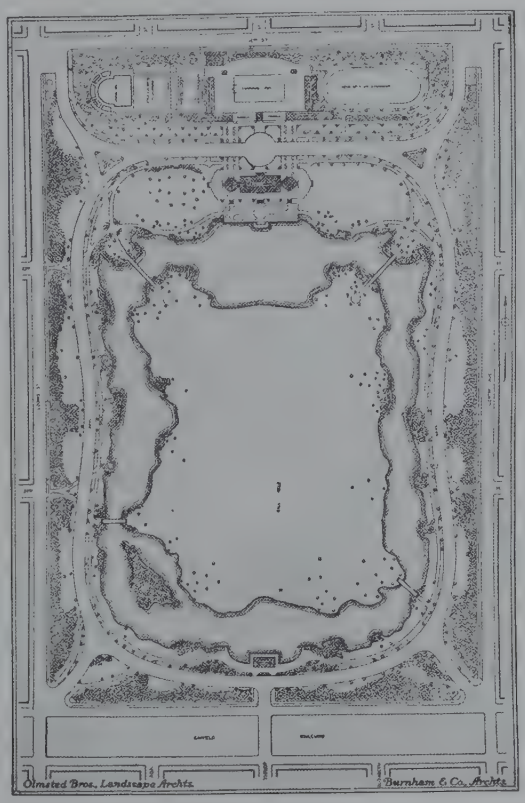

Figure 269. Proposed "Sherman Playground", Chicago, as planned by Olmsted Bros., Landscape Architects, and Burnham & Co., Architects. From "The Plan of Chicago".

How the departmental buildings frame the City Hall of lower height is shown in the elevation, Figure 270. It is interesting to compare this elevation with that of the proposed "civic center" of the Chicago plan, Figure 271, (a composition by F. Janin, whose beautiful, but unsuccessful Grand Prix plan—it was placed second—is shown in Figure 186); here skyscrapers make a frame around the group of public buildings, but of these the center, or administration building, is topped by a huge dome on a drum which towers over the surrounding fourteen story buildings. This is a truly big conception—a dome immensely bigger than that of St. Peter's at Rome, enough bigger so that it might by its impressive height dominate the surrounding high buildings just as St. Peter's dome dominates Rome, and stand as the symbol of civic order and unity.

The Grand Prix de Rome, 1913, by Séassal (Figure 181), and the plan by Castel, placed second in that competition (Figure 167), are other examples of large compositions in plan. Much smaller in scale, but depending upon the same principles of composition, the same arrangement about axes of symmetry, is the competitive plan for the American Academy in Rome Prize, 1912, Figure 272, by Hastings, for "A Naval Station". The programs for the scholarship competitions usually require a study in a plan large in size, for such a plan will require the competitor to show the extent of his knowledge in many directions, and preclude the chances of the prize being awarded on a "lucky break", as might happen if the solution of a simpler problem were called for. In

Figure 270. "A City Hall for a Commission Form of Government," by Harry Sternfeld. Paris Prize, 1914.
(See plan on page XII.)

Figure 271. Elevation showing the group of buildings constituting the proposed Civic Center, Chicago. Drawing by F. Janin. From "The Plan of Chicago".

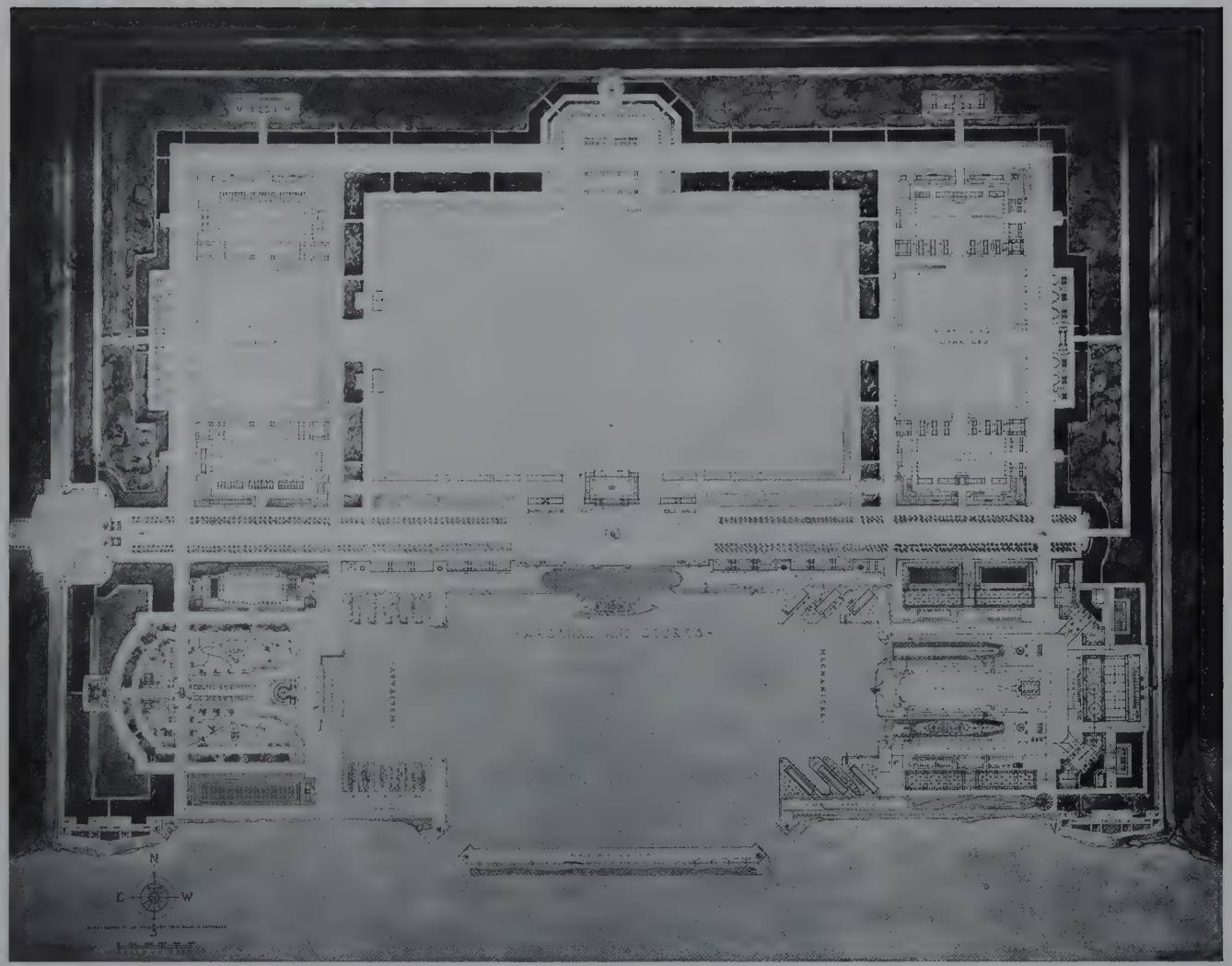

Figure 272. "A Naval Station", Placed 2nd, Competition for the Prize of the American Academy in Rome, 1912. Frederick W. Hastings, University of Pennsylvania.

the solutions of these programs could be found several Class A problems, just as a number of Class B problems could be made from one in Class A.

Very often the student will come upon the problems of a "grand plan" in the esquisse-esquisse competitions before having a chance to study one in a regular projet. The twenty-four hour sketch problem of the Second Preliminary Competition for the Paris Prize is always a large plan, and the competition is so keen that a great degree of proficiency is necessary to be admitted, through this competition, as a "logist" for the final. One who has his eye on the Paris Prize—or any other of the large scholarship prizes—should, therefore, watch for, and take, a Class A problem that will give him some knowledge of composition on a large scale. In a sense, this part of architectural study is the goal of all the previous training; it represents the height toward which all the rest have been but stepping stones. If the designer is ambitious, and believes in himself, here is his opportunity to prove his mettle and get for himself a "place in the sun".

The esquisse-esquisse is the very best sort of training for the big plan problem. It necessarily restricts itself to the essentials—to the finding of a parti and composing its presentation. And this is what one must do in a big plan projet. The rest is largely a matter of draftsmanship, of technical skill— of details which can be considered as just so many Class B problems at a small scale.

Some students will find this particular kind of problem extremely difficult to do; for it requires a different sort of mental ability from the decorative, more "artistic" parts of architecture. But the harder it is to work out the more serious should be the effort to get a real grasp of the principles underlying this part of architectural design.

Figure 273. A Restoration of the Circular Pavilion at Hadrian's Villa Near Tivoli, by P. T. Shutze, Fellow in Architecture, American Academy in Rome, 1915-18.

THE CLASS A PROBLEM

Chapter XXIX

"MOSAIC" IN ACTUAL BUILDINGS

AFTER doing a number of projets, and using "mosaic" on plans to explain the parti, it is worth while to take a vacation from the atelier viewpoint to see the use that has been made of mosaic in the buildings of the past, and in present day buildings. Such an excursion will not only be diverting, but will give a broader background from which to work again at atelier mosaic with a better understanding of the real truths that underlie this convention. It will enlarge one's vocabulary of forms and give new ideas as to how the forms may be used.

While making this research we must bear in mind that "mosaic" as used on plans *is* a convention, and that while we use a floor pattern here, a ceiling there, in some places we will use arrangements purely conventional and not taken from actual building. For instance, a half-circle is frequently put at openings to carry the "white" in and express the idea of an opening through which one may enter; and lines are often used to connect each pair of trees when two rows form a vista. So, when we look up historical examples it is not with the idea of making our plan mosaic fit into historical or practical clothing, but to find new elements that we may fit into our conventions for greater variety and interest. As explained before, the primary use of mosaic in a projet is to help explain the scheme; a showing of only such patterns as would be suitable for building into the floor or ceiling would frequently defeat this purpose. A projet is not—should not be—either a working drawing or a "measured drawing", as we use this term to mean a statement of executed work.

Undoubtedly some thought was given to floor patterns almost as soon as man decorated the walls of his buildings. By the time Greek culture was in the ascendant these pavement forms were already intri-

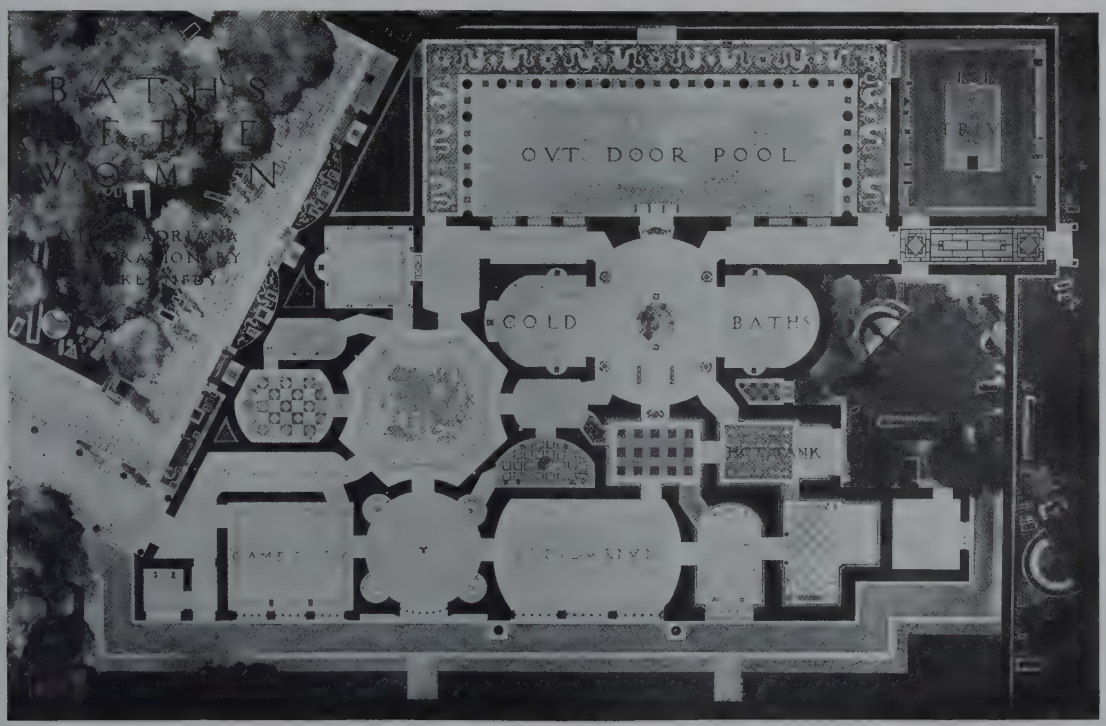

Figure 274. Plan of Women's Baths, Hadrian's Villa, as Restored by R. N. Kennedy, Fellow in Architecture, American Academy in Rome, 1916-19.

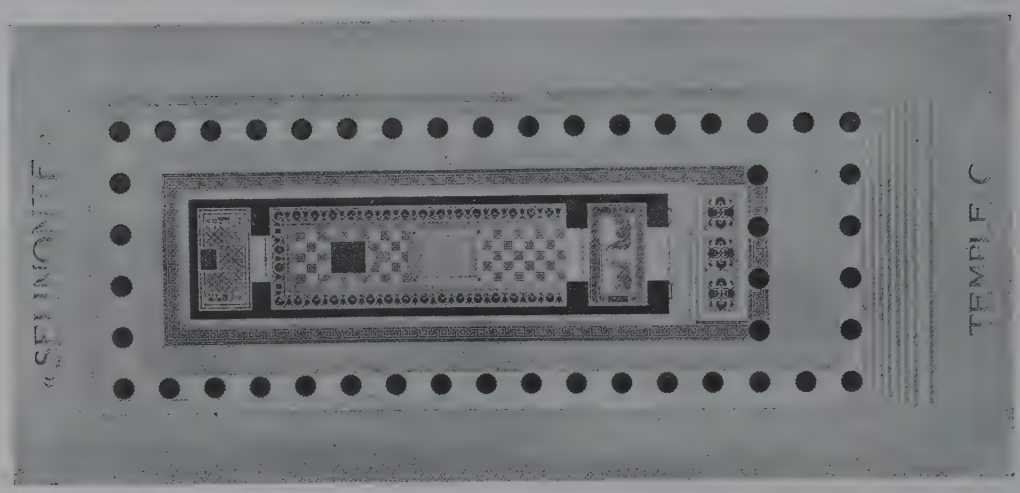

Figure 275. Plan of Temple at Selinonte as Restored by Hulot, 1904, French Academy at Rome. From "Monuments Antiques".

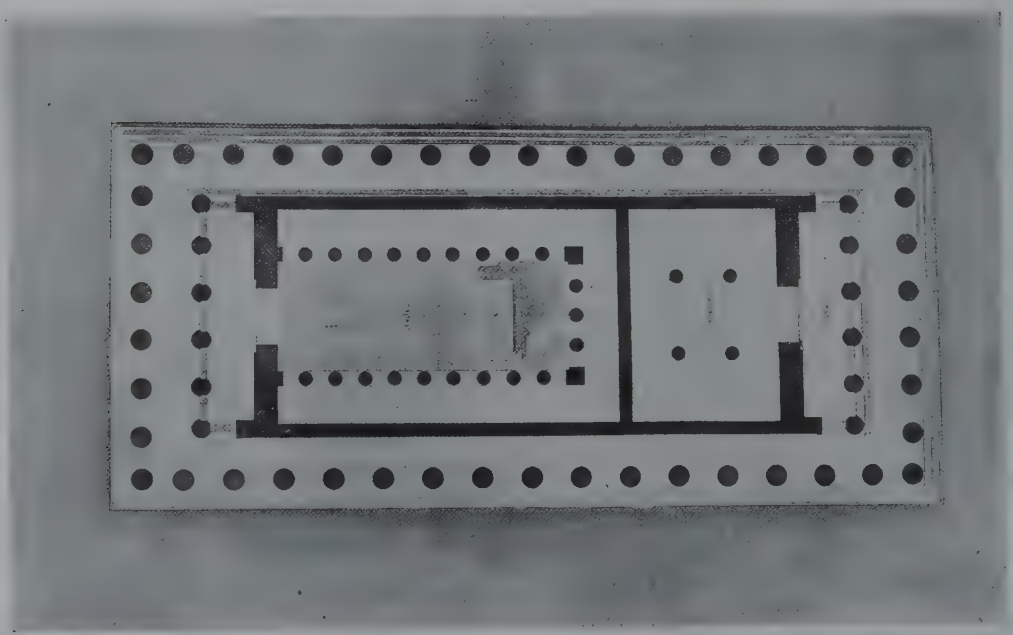

Figure 276. Plan of the Parthenon as Restored by Paccard, 1845, French Academy at Rome. From "Monuments Antiques".

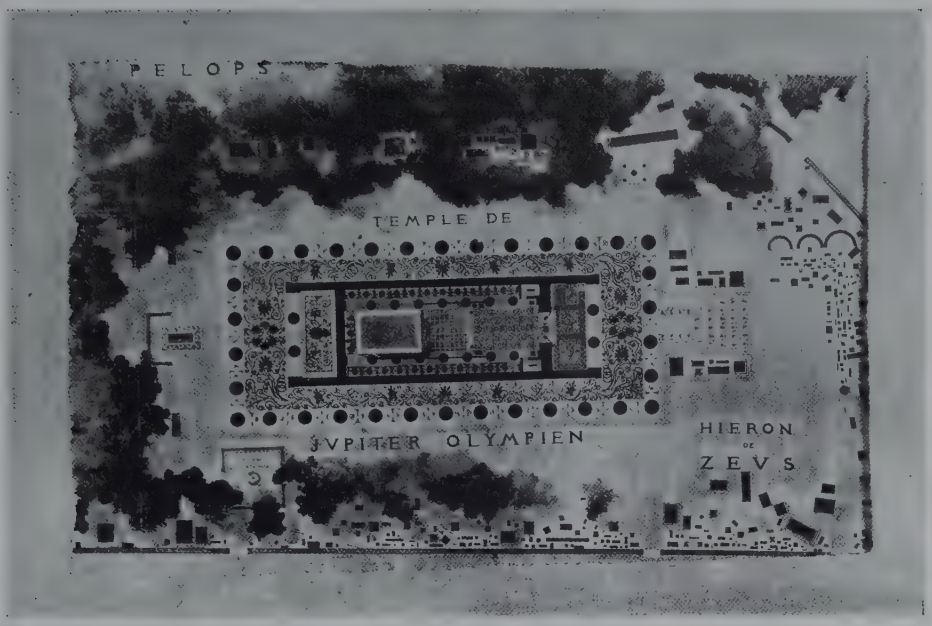

Figure 277. Plan of Temple of Jupiter Olympus at Olympia, as Restored by Laloux, 1883, at the French Academy at Rome. From "Monuments Antiques".

cate, and undoubtedly costly in some of the temples.

The Parthenon had a simple floor of marble slabs (Figure 276), but these were slabs of Pentelic marble—rich in quality, even in color, fine in grain, and were no doubt fitted together with that remarkable precision that characterizes the stone work of the walls and columns.

In the Greek colonies, where marbles of such fineness were not to be had, the floors were made of smaller bits of stone and marble, arranged in patterned forms, such as that of the temple at Selinonte shown in Figure 275. In some cases these patterns were exceedingly elaborate, as in the Temple of Jupiter Olympus at Olympia (Figure 277) where the floor is lace-like in character. In these examples it is well to note the great variety of patterns used, some quite geometrical, others not at all so. Of course, these are "restorations" of the plans of these temples, but they are based on existing fragments and on coins and other documents of the period.

Roman art was an extension of the Greek, and the same pavement forms—a little stiffer in composition—were used. The richness of the various pavements of the circular pavilion at Hadrian's villa (Figure 273) is lost in reproduction. Much of the effect was obtained by pieces of marble of many different colors which were exquisitely shown in this drawing, but are here simply different kinds of gray. The pavements of the Women's Baths at Hadrian's Villa (Figure 274) have more of the freer forms found in the Greek examples; these, too, were carried out in an infinite variety of color. If we turn for a moment to the winning plan of the 1923 Le-Brun Scholarship Competition (page X) we see these forms used in a recent presentation.

The early Christians used floors based on the same principle (Figure 281), but with larger pieces in a great variety of geometrical designs; frequently there was no attempt to make opposite sides of a floor identical in design. This example, the church of S. Clemente at Rome, shows how columns from a number of old Roman temples were incorporated in one design—sometimes with a cap or base a few sizes too large, or with a plinth to bring a column up to the height of the others. The stones used in these patterned floors were filched from the pagan buildings in the same way.

In the Renaissance this tradition was revived, but the floors were designed with more thought to the floor as a whole—with a border and a field, and with ornaments at important places in the field. In the Church of the Miracoli at Venice (Figure 278) a strip down the center of the floor, the path which the processions followed, was treated like a rug, a custom since followed in many modern churches—at the Chapel of the Intercession in New York, for example.

In the gallery of the Braccio Nuovo at the Vatican there were set into the floor of large marble slabs complete classic Roman pavements of the type made of small pieces of marble (Figure 280), just as Roman bas-reliefs were set into the walls. The floor incorporates some of the exhibits.

These are only a few examples of the many kinds of floors that have been built. Even a casual search through the usual documents will show many more and of great variety. One or two other examples may be mentioned that would repay the effort of hunting for them; the pavement of Siena Cathedral, with its inlaid allegorical subjects; that of St. Peter's

Figure 278. S. Maria dei Miracoli, Venice. Early Renaissance.

Figure 279. Ceiling, Chiaramonte Palace at Palermo, 14th Century.

Figure 280. Braccio Nuovo Gallery, Vatican Museum, Rome.

Figure 281. Church of S. Clemente, Rome, 9th Century.

Figure 282. The Borgia Apartments at the Vatican, Rome. From "D'Espouy".

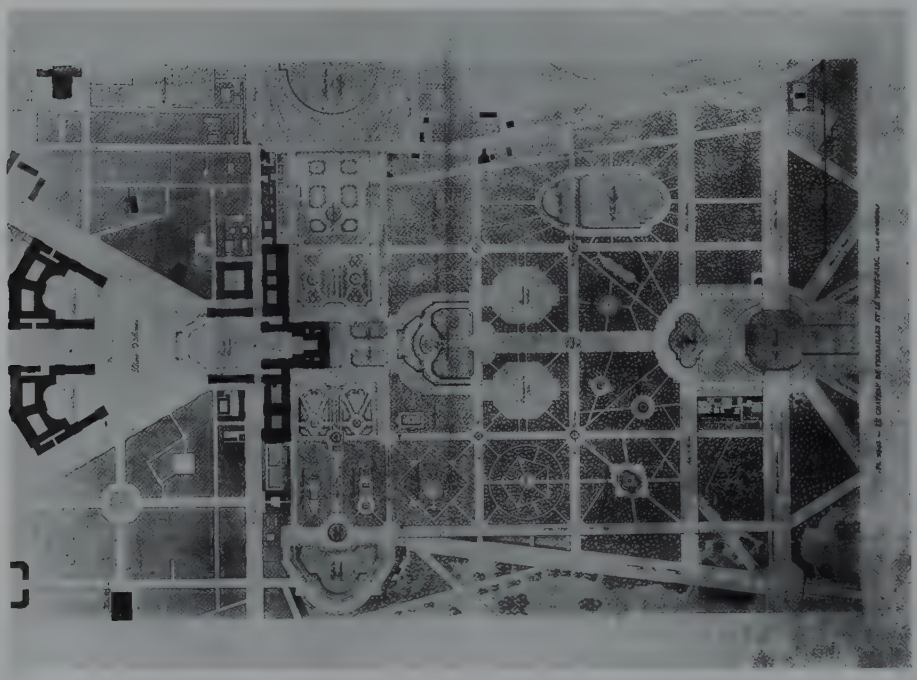

Figure 283. The Park and Château at Versailles.
From Gromort's "Choix de Plans de Grandes Compositions Exécutées".
For plan of the entire composition see Figure 261.

at Rome, with the coats-of-arms of the Papal families; and the paving about Napoleon's tomb in the Invalides at Paris.

Then, too, there are ceiling patterns to study. The early roofs were of wood, and the early ceilings were simply the undersides of the roof or floor construction—very simple in lines. These eleméntal surfaces were sometimes decorated with painting and striping as at the Château Blois. In the Chiaramonte Palace at Palermo (Figure 279), is a richer ceiling of the same kind, every square inch covered with painted embellishment. A ceiling of this type is frequently used on a plan to indicate a dining room, or a club lounge.

The Romans and the Renaissance builders used vaults of various kinds. These were sometimes decorated by coffers only, as at the Pantheon, sometimes with elaborately designed patterns—partly modelled and partly only painted—as in the Loggia of the Villa Madama (by which the great hall of the Cunard Building in New York was inspired), and the loges of Raphael at the Vatican. An example of this kind of ceiling is shown in Figure 282, the Borgia Apartments at the Vatican, where the vaults are warped over irregular surfaces, decorated with raised mouldings, and have paintings in the panels so formed, the paintings in this case by Raphael.

Sometimes flat ceilings were decorated in the same way, as the one shown in Figure 284 from the Ducal Palace at Venice, for which Veronese made the inset paintings. This is rich and elaborate, but still formal. The ceiling in the Farnese Palace, shown in Figure 224, is of the same general character. During the French Renaissance, the ceilings of the great Salles de Fête, flattened vaults of plaster, were ornate with decoration—sometimes patterned and geometrical, sometimes containing human figures or mythical gods, well modelled and well composed. The most elaborate of these, at the same time some of the best, are in the Palace of Versailles. (See Figures 132 and 133.) Today there are few workmen who can approach the standards of those days.

The journeys through the documents should not stop at ceilings and floors, however. Furniture, layouts of machinery in a mill, the top views of ships, locomotives, automobiles, all have their uses. One of the new sources of study is the aeroplane photograph which can give many suggestions in the study of large plans and their entourage.

The plan of the park of the Palace at Versailles, Figure 283, a "measured drawing" showing that which exists—will give many hints as to the furnishing of the entourage, the use of the points and accents that help so much to give life to a plan. Some of these may be trees, some lamp-posts, some statuary; they all can be used in "composing" that conventional drawing, the plan. (See Figure 183, aeroplane photograph of a part of this garden.)

De Neufforge, Blondel, Percier and Fontaine, in their plans showing garden forms will give many other hints as to the handling of entourage. The pattern in the paving of the forecourt of St. Peter's at Rome (Figure 193), shows how much actual value there is in a few lines of mosaic even in such a large space.

Supplement this kind of research by a study of the best of modern buildings. A trip to New York for this purpose—or to a lesser extent to Boston, Chicago, Philadelphia, Washington, Detroit or San Francisco—could be a liberal education in itself. A voyage also can be made through the current architectural magazines, where material, good, bad and indifferent, is to be found in profusion.

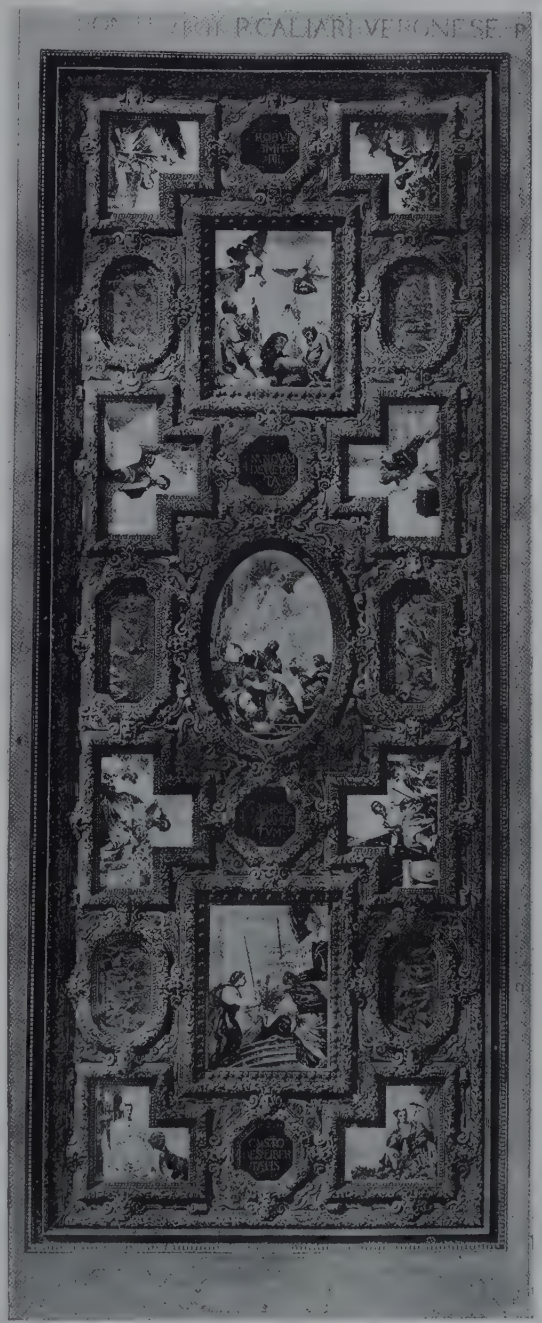

Figure 284. Ceiling in the Ducal Palace, Venice.

Figure 285. The Beacon of Progress, by Désiré Despradelle.

THE CLASS A PROBLEM

Chapter XXX

THE CLASS A DECORATIVE PROBLEM

MOST of the Beaux-Arts problems—whether in Class A or Class B—are what we would call "plan problems": the essential requirement of these problems is the formation of a scheme or "parti" and its clear expression—the study of the arrangement of the several rooms or other units called for in the program. It is this requirement that must be solved and satisfactorily presented if an award is to be won. Each of these problems calls for an elevation, and many also require a section, so that there is some study in the composition of façades in these problems; but these façades are at so small a scale that the study is only in the arrangement of the big elements of the composition. There is no opportunity for the study of detail, or of the effects of materials, of color, of texture, or the many smaller arrangements of an architectural composition that always must be worked out in the *execution* of a piece of work.

In these distinctly "plan" problems one can not win a medal, for instance, unless the parti is sound—no matter how clever or well composed the elevation, or how well presented, or how interesting the architectural details.

And yet it is these well studied details in executed work that interest the "man in the street", the possible client. The average man, the average client, understands little of plan. If a building is poorly designed for its purpose, if it "does not work", he is conscious that *something is wrong,* but he could not tell what. He would most likely blame it on the "style" in which the building is built and which he finds unpleasing.

But if the building does "work" well and fulfills all the demands of its daily use, and the arrangement of the architectural elements that greets the eye is not pleasing, the average man will lose sight of the good working qualities of the building and will think only of its ugliness.

And so what has been called the "stage scenery" of architecture is of very real importance, as well as being quite fascinating. It is the "stage scenery" and the interesting little details of execution that develop the big practices of many successful architects.

This is one reason why there are given in Class A a number of so-called "decorative" problems. These are problems which are primarily studies in composition, in elevation or section—studies in the use and combination of motives, in ornament, in "character" and personality. A plan is called for, of course, but the problem is primarily one in the arrangement of the things the eye sees in the completed building.

In such a case the problem is, in some ways, very much like the analytique as to program, scale, etc., but in other ways it is very different. An analytique arrangement of the sheet with details at large scale is not required. And while the analytique is always primarily a study of the documents, the Class A decorative problem is very much more complicated than this. It is a study in the composition of architectural forms, as these may be arranged by one who has had enough training in the use of such forms and in the study of documents to build up a "vocabulary" of what we might call personal preference forms, ideas, arrangements, details.

The kind of study used for the analytique would be inadequate for these problems. Now is the time to express one's own individuality (which, as an aim, is *not desirable* in the analytique); now is the time to develop one's own style. We cannot aim at such a personal expression until after a thorough training in the elemental forms of architecture, as they have been used in the different periods of history, and a study of how they have developed from constructional and other needs. For our expression is only equal to our thought.

The early problems have formed the foundation for this personal expression. With so many architectural forms to choose from, and the choice depending partly on one's temperament and partly on one's training, there is no excuse for being a mere copyist of some one else's style. This expression of one's individuality is the real fun in the study of architecture. In this study, in this development of a personal expression, we must be broad minded enough to recognize the beauty in all styles, in Gothic as well as Renaissance, in Roman as well as Greek, for they each have their beauty if we look for it with unprejudiced eyes. Aesthetic science in this is like botany—the rose, the iris, the geranium and the cactus are of equal interest to a real *student.*

These decorative problems give an opportunity to develop one's own style: they also give an opportunity to develop the imagination, which plays so important a part in creative work. This is best done by a study of imagination in others. A hunt through the documents for ideas, to freshen one's imagination, is good at the beginning of every problem, but especially so for the decorative problem. For these there may be several such research hunts—one at the beginning, with only the general scheme of the problem in mind, others later when the problem reaches the stage of details, each with the idea of seeking new ideas and a refreshening and stimulating of one's mind, a little different from the usual use of documents during the study of a problem, when

Figure 286. The Beacon of Progress, Detail of Elevation, by Désiré Despradelle.

Figure 287. The Beacon of Progress, Detail of Perspective, by Désiré Despradelle.

Figure 288. "The Monumental Treatment of the Lower End of Manhattan Island," by Burnham Hoyt. Placed Second in the Paris Prize Competition for 1913.

one is seeking for development of ideas already decided upon rather than for new ideas.

In the "Receuil d'Architecture" of de Neufforge something new will be discovered each time one turns the pages. Blondel and the "Grand Durand" are also valuable in a search for ideas. The monographs of the researches of the Grand Prix de Rome men, such as the "Selinonte" of Hulot, and the "Restauration d'Olympie", by Laloux, are full of ideas. D'Espouy's "Monuments Antiques" reprints a few drawings of each of the Grand Prix men, but the many small explanatory drawings and the illustration in the text are, of course, missing.

These are but a few of the books that may be turned to at such a time. A visit to a good architectural library will disclose many others.

It is interesting to look at a work of our own times that has been highly praised because of its imaginative qualities, Despradelle's "Beacon of Progress" (Figure 285). There are echoes of what has been before, of course, for otherwise it would be too alien to our taste to appeal to us, but with these is enough of the new and the personal to give a new thrill and stir the imagination within ourselves. Compare with this the Paris Prize elevation of McLachlan, 1920 (Figure 366), and the elevation submitted by Burnham Hoyt for the 1913 Paris Prize (Figure 288), perhaps the most imaginative drawing ever submitted in a student competition in America, and highly praised by the jury for "its great imaginative quality.....it was a most daring conception, showing much thought, feeling and artistic ability.....a conception based on a quotation from Zangwill, 'New York, the crucible, where the great alchemist melts and fuses with his purging flame the Celt, Saxon, Slav and Teuton, Latin, Greek, Syrian and Jew, into a new race, rising Phœnix-like from the fire.'"

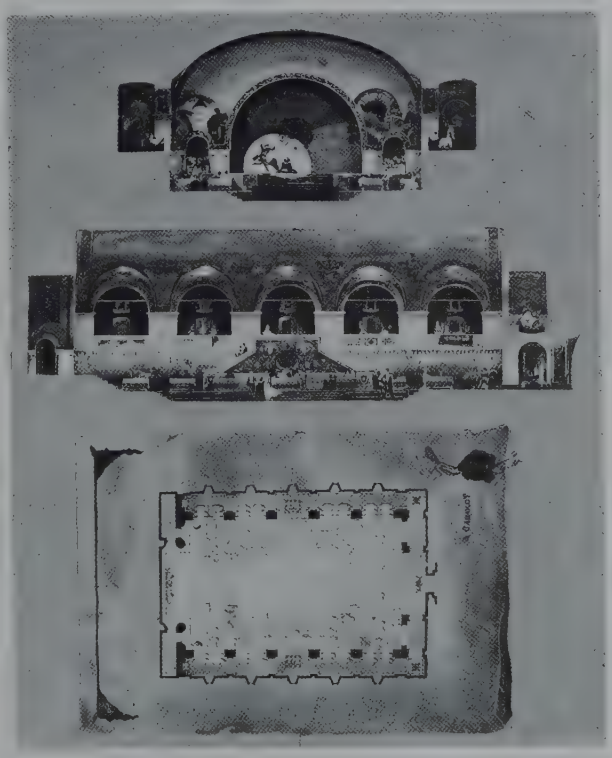

Figure 289. Class A Problem, "A Cabaret," 1st Medal, Beaux-Arts Institute of Design. B. Riaboff, University of Pennsylvania.

Both of these drawings were probably inspired in part by Despradelle's creation. In the detail of the elevation, Figure 286, we find much that recalls Piranesi, another author of books full of potential ideas, but the motives are used in new ways not at all reminiscent of Piranesi. The perspective, Figure 285, shows at larger scale the interesting use of old forms in new ways. All three drawings are magnificently rendered. They were purchased by the French Government for the Luxembourg collection.

This monument was half again as high as the Eiffel tower. But while size itself does give an imaginative quality, there are times when size would not be appropriate. The dictionary* defines imagination as "the act or power of combining the products of past experience in modified, new, or ideal forms; the creative or constructive power of the mind." Novelty, originality, variety, fantasy, symbolism, all have a bearing. Or the exotic may lend the touch of imagination, as in the cabaret problem of Figure 289, where the Russian style was used.

It is because imagination is considered desirable, because the "products of past experience" *should* be combined in "modified, new, or ideal forms", that there is an effort made, in a school program, to add some new requirement, or change in requirements, so that the problem cannot be just a copy of what has gone before. In the problems of actual practice the conditions of site or requirements of the client are usually sufficient to make the problem different from old ones. Henry Hornbostel—whose opinion in such matters may be taken without the proverbial grain of salt because he has been so eminently successful in architectural competitions,—once said, though I quote from memory only and not verbatim, that in any problem there are certain features that recall previous examples that have been solved; sift these out until there is left, finally, the conditions of the program that are new with this problem, that have not been done before; and put all your thought, and your effort, in the solution of these parts. This advice will be found of particular value in doing sketch problems, as we shall see later, especially the large plan sketch problem, such as the Warren prize or the second preliminary for the Paris Prize.

* *New Standard Dictionary*

Figure 290. "Un Pont Aqueduc," M. Choupaut, 1st Medal, Ecole des Beaux Arts.

This element that is "new" in the requirements may be in the program, as in Figure 290, where a bridge and aqueduct crossed a river between two countries where it forked, a commemorative tablet and character being called for. Or it may be in new forms of construction, as in the two bridges (Figures 291-292) where one is of concrete, the other of steel, both materials only recently passing beyond the experimental stage. Or it may be inserted by the mind of the designer, nothing in the program requiring any novel feature, but nothing, likewise, preventing a new handling of an old problem. The Rougevin Competition of 1922-23 called in its program for a private bathing pool, with an alcove at one end for a couch or divan. Many solutions were variations of the Pompeiian or other historical examples of fairly similar problems, but the first and second prizes (Figures 293 and 294) stood out from the others because of their simplicity and originality of treatment.

The division into plan problems and decorative problems is echoed in the sketch problems. The Warren Prize is always given for a plan competition, the Pupin and the Emerson prizes for decorative competitions. There is a similar arrangement at the Ecole des Beaux Arts in Paris—the Labarre is, like the Warren, a plan competition (see Figures 231, 233); the Rougevin, like the Emerson and the Pupin, a decorative competition. Some of the Rougevin competitions are not architecture at all—they are studies in pure composition, like the float representing the fine arts (Figure 296), while others are studies in composition in two dimensions only, such as the bank-note shown in Figure 295.

And just as the success of the plan problem depended on the "parti", (which is a schematic composition of the different elements called for in the program) so the decorative problem depends in large measure on composition, and, as we have just pointed out, this composition is sometimes of mass in three dimensions—sometimes of façade, which is practically in two dimensions—sometimes in an arrangement absolutely in two dimensions as the bank-note mentioned above, or a frontispiece, or a title page, or some other subject of like nature. But in addition to this requirement of good composition, two other things are necessary for an award in a decorative problem—one is the presentation, requiring a technique much more brilliant than that which will suffice for a plan problem—a greater ability to draw, especially the freehand or curved forms, and in particular the human figure; the other is imagination in the use of documents—which may be another way of saying a wider knowledge of documents and a surer sense of what is appropriate in a given case; or to put it in still another way, a development of one's personal style and taste.

It is in the *composition* of his problem that the student will call most heavily upon his Patron. For good composition is an elusive thing, depending on rules that have been formed slowly by tradition, and having little connection with logic or the mathe-

Figure 291. Class A Problem, "A Bridge," 1st Medal, Beaux-Arts Institute of Design. J. K. Smith, University of Pennsylvania.

Figure 292. Class A Problem, "A Bridge," 1st Medal, Beaux-Arts Institute of Design. S. J. Laschenski, University of Pennsylvania.

matical forms of reasoning. Rules of composition have been laid down by those who have analyzed the compositions of the past—they may be found in the numerous books on composition:—rules such as these, "to achieve a unified composition, all the elements should have a definite relation to each other and to the composition as a whole: all parts of the composition should be in the same scale (i.e. it would not do to have a portion *seem* at a different scale from the rest), they must all be of the same stylistic character (or if the parts are taken from documents of different style, they must all be seen through eyes steeped in the chosen style)," etc., etc.

But at best the rules can be only a help, and we must always keep in mind that in matters of art it is quite often the exception that proves the rule—we come across so many masterpieces that seem to break many of the rules, so that finally the rule has a lot of exceptions after it.

A plan, of course, is a composition, and student plans must be studied as compositions to be successful. Sometimes plans are very decorative as compositions of blacks and whites, of fields and bands of varying tones. But the usual plan, after being built, from its very nature, *can never be seen* as a composition as we see it on paper—on paper it is a conventionalized representation. The elevation is also a conventional drawing—in that it is geometrical, and not in perspective—but it approaches much more nearly the appearance of reality than a plan.

And with this feeling of reality, the detail takes much more importance—becomes of more interest, and the larger the scale specified for the problem the more important becomes the study of detail—profiles, textures, ornament and the disposition of ornament. There is a temptation, in a drawing at large scale, to use a great deal of interesting ornament, because it is interesting to draw. The many different moulding embellishments used in such work as the Porte Jean Goujon at the Louvre (Figure 297) are fascinating because of their variety. The appropriateness of this amount of decoration depends on the character called for by the program.

Figure 293. "La Decoration d'Une Piscine Privée", 1st Prize, Rougevin Competition, Ecole des Beaux Arts. M. Le Même.

Ornament is usually more effective if concentrated in places where it will tell most, than if spread evenly over the whole surface. Where free in outline, not just decoration of a moulding and therefore confined between two lines, ornament is in reality sculpture, and must be thought of first in its mass, its silhouette and after that as to its detail. The trophy carvings on the Porte Saint Denis at Paris (Figure 298) have this sculptural quality: it is interesting to note the gradation in relief from top to bottom, the figures at the bottom being in the round, the upper motives being almost bas-reliefs.

Change in material requires a change in treatment in these problems. The difference between stone and metal,—the difference between marble and

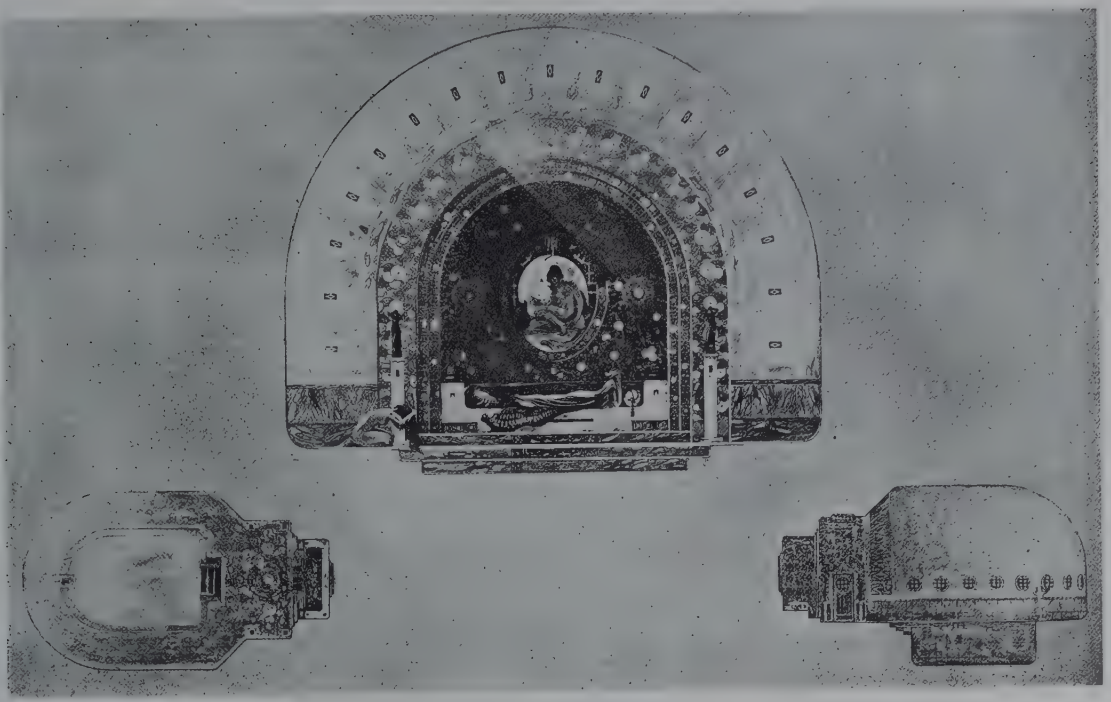

Figure 294. "La Decoration d'Une Piscine Privée", 2nd Prize, Rougevin Competition, Ecole des Beaux Arts. M. Berthelot.

granite, between bronze and iron,—means a difference in design in their use.

This is partly a question of scale, and partly a question of the innate qualities of the material. Where a stone column is embellished with a bronze cap and base (the bronze being only a shell, of course, around a stone core), this difference in scale may be seen. The stone fillets, on the necking of the column or on the entablature above, cannot very well be less than half an inch in width—because of the mechanical difficulties of cutting narrower bands, and also because all the beauty of texture of the stone itself would be lost if it were cut into too many surfaces—while the fillets in the bronze are not only much smaller than this, but the arrises are sharper, frequently being undercut and knife-like, which is a quite suitable and proper use of a metal but inappropriate and practically impossible in even a finely grained marble.

Silhouettes in bronze or iron are, for the same reason, pointed and sharp and with many subdivisions of surface, while silhouettes in stone are rounded, or made of planes meeting at an angle of ninety degrees, and of few parts. A wide surface of bronze would not look well if left plain; the panels or wide surfaces of bronze doors, sarcophagi and urns are usually decorated with bands or low relief decoration in an all-over pattern, for its greatest beauty lies in the play of high-lights on the polished surface, contrasting with the shadows and roughened surfaces. Stone, on the other hand, frequently has great beauty in the material itself, in its color, texture, veining or surfacing, and this is lost, or the effect greatly lessened, by carving or ornament.

Figure 295. "Le Modèle Type d'un Billet de Banque de Mille Francs", 1st Prize, Rougevin Competition, 1912. Roger Expert.

And iron is different from bronze. Because of the way in which the metals are worked a design suitable for wrought iron, in which the several pieces are forged out of bars by a succession of hand hammerings, cannot properly be executed in bronze,

Figure 296. "Un Char Représantant les Beaux Arts," Rougevin Competition, Ecole des Beaux Arts, Second Prize, 1st Medal. M. Lindu, pupil of M. Pontremoli.

Figure 297. Porte Jean Goujon Louvre.

which metal is cast in a mould, the mould having been made from a model. As the model is made in wax, or clay, or plaster, materials easily smoothed, and capable of being worked with precision, the result is very different from the more spontaneous freehand aspect innate in wrought iron. And there is a difference between cast iron and cast bronze; though both are cast from models or patterns, the iron being tougher and larger grained cannot take such pure lines or detailed ornament as the bronze. The difference between cast and wrought metal—in this case iron in either example—is well shown in Figures 209 and 210. The cast metal is stiff, hard, dignified; the wrought metal informal, even playful.

Wood also is smaller in scale than is stone, which is one reason for the smaller scale of interiors, where wood plays so large a part. Plaster, when it accompanies woodwork to make the finish of a room, partakes of the finer scale of the woodwork.

The details of the Louvre and the Palace of Versailles, though too ornate for general use in our time and for our social structure, are nevertheless wonderful documents as to the proper use of materials. In the Salon de la Guerre (see Figure 133) the doors are of wood, the ceilings of plaster—partly modelled, and painted—the walls are of marble in different colors, with trophies and other ornaments of bronze. All of these details have been made by master craftsmen and the finish is exquisite; each material is treated in a manner proper to that material.

Tile, and marble and glass mosaic may give many interesting effects. We have spoken of their use in floors, of which the many patterns in the church of San Marco at Venice, Figure 128, are good examples; but these materials are also used for wall decorations. The Byzantines so used them—the church of San Marco and the churches at Ravello are lined with glass mosaic—and in the "modern" style, particularly that type of modern design which was shown at the Paris Exposition of Decorative Arts in 1925, these materials are used to give color and interest to wall surfaces. The pool room shown in Figure 294 is so treated; unfortunately the color is not here reproduced.

Of course, these differences in the uses of materials can only show in a drawing by accuracy of drafting and care in the modelling of rendering. Without such care iron, bronze, wood, and stone are all alike—characterless.

It is because size and scale have so much to do with proportion and design that a note made of any detail found in a document should include a graphic scale or measure, so that the portions of the document will be visualized in feet and inches. Not only should this be done in hunting for ideas in books or photographs, but when making sketches of detail taken from actual buildings. Some motives exceedingly beautiful at one size are quite ugly when made smaller or larger. Our cities are full of examples of such use of ideas by those who did not take the trouble to use a rule.

Figure 298. Porte Saint Denis, Paris.

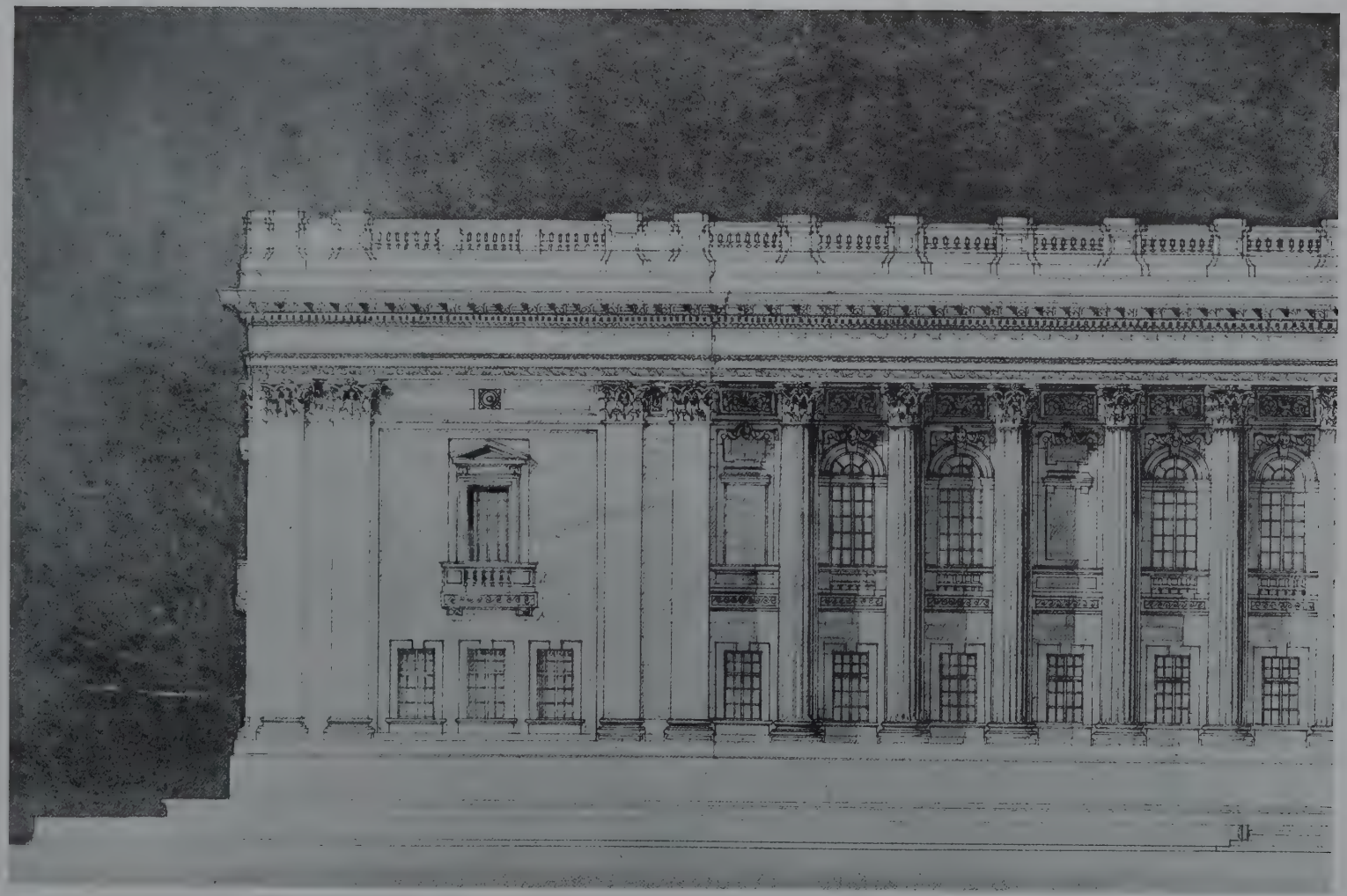

Figure 299. Design by Albert Kelsey. Competition for Department of State Building, Washington, D. C. Portion of the Elevation at Original Scale, Drawn by Grant M. Simon (Winner of the Paris Prize, 1913).

THE CLASS A PROBLEM

Chapter XXXI

DRAWING IN THE CLASS A PROJET AND IN COMPETITIONS

WHEN a man has won his way to Class A by making his points in the Analytique and Class B projets, he has gained quite a little experience. He may have become a fairly able and clever draftsman, for the more a man draws the better his drawing will be; that is, if he thinks while he draws, and the drawing is not just a perfunctory mechanical process. Sometimes this progress in the ability to express one's thoughts has been more rapid than the ability to think clearly what should be expressed, and a student begins to have a very good opinion of himself as a *designer* because he knows himself to be a clever *draftsman,* an able draftsman—able to draw, able to *indicate.*

So it is well to consider just what good draftsmanship is really worth. As we have said before, draftsmanship, presentation, alone will not win an award. Perhaps this is not as true of an archæology or a measured drawing, for in these there is no parti to choose, and one who can compose a sheet made up of small scale drawings and large scale details, and can draw and render this composition well, will win his medal; the only other necessary qualification being an *intelligent* use of the *right* documents and some imagination in their use. In any other case the first essential is the solution of the problem—a good parti.

If, as happens every so often, one student's solution of a problem stands out above all the others because, by clear thinking, he has found a distinctly satisfying parti, this man will be given the highest award. If the problem is not well drawn or presented, the award is not likely to be a first medal, but no other problem, with poorer parti, will be given a medal. I remember one program for "A Stock Exchange," in which a very large room was called for, for the operations of the exchange itself, an exchange or board room—"as large a room as possible", the program stated. There were many problems based on the Ecole solution for an exchange—the board room, or exchange, surrounded by a corridor, and on the outside of the corridor, the minor offices and committee rooms—such a parti as is shown in Jaussely's Grand Prix de Rome

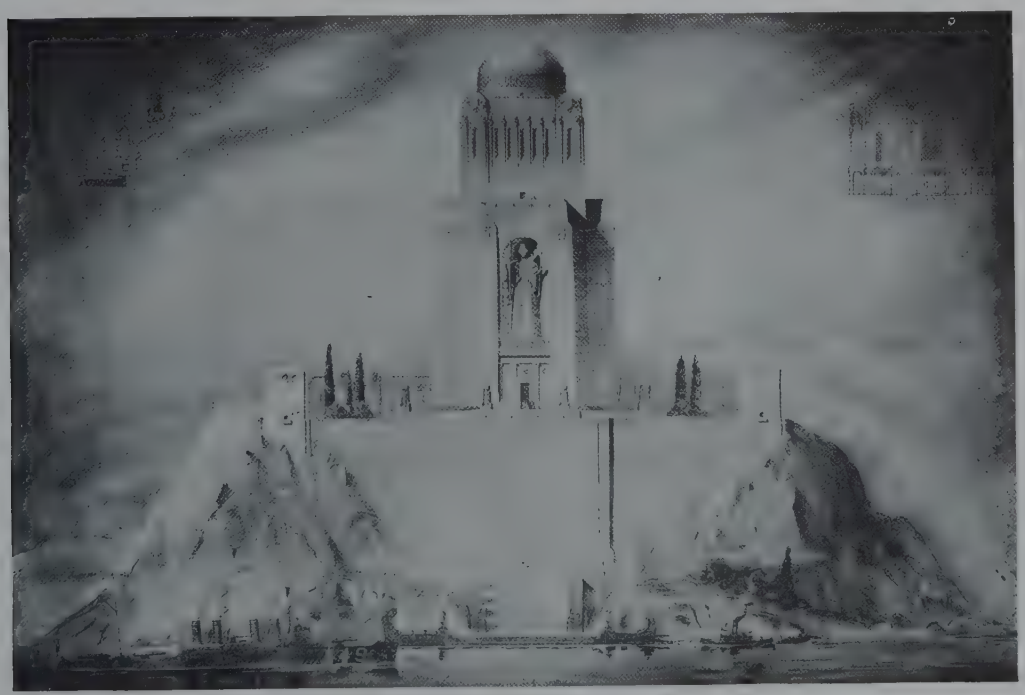

Figure 300. Design by Clayton Evans Jenkins for "A Naval Pantheon," Class A Projet.

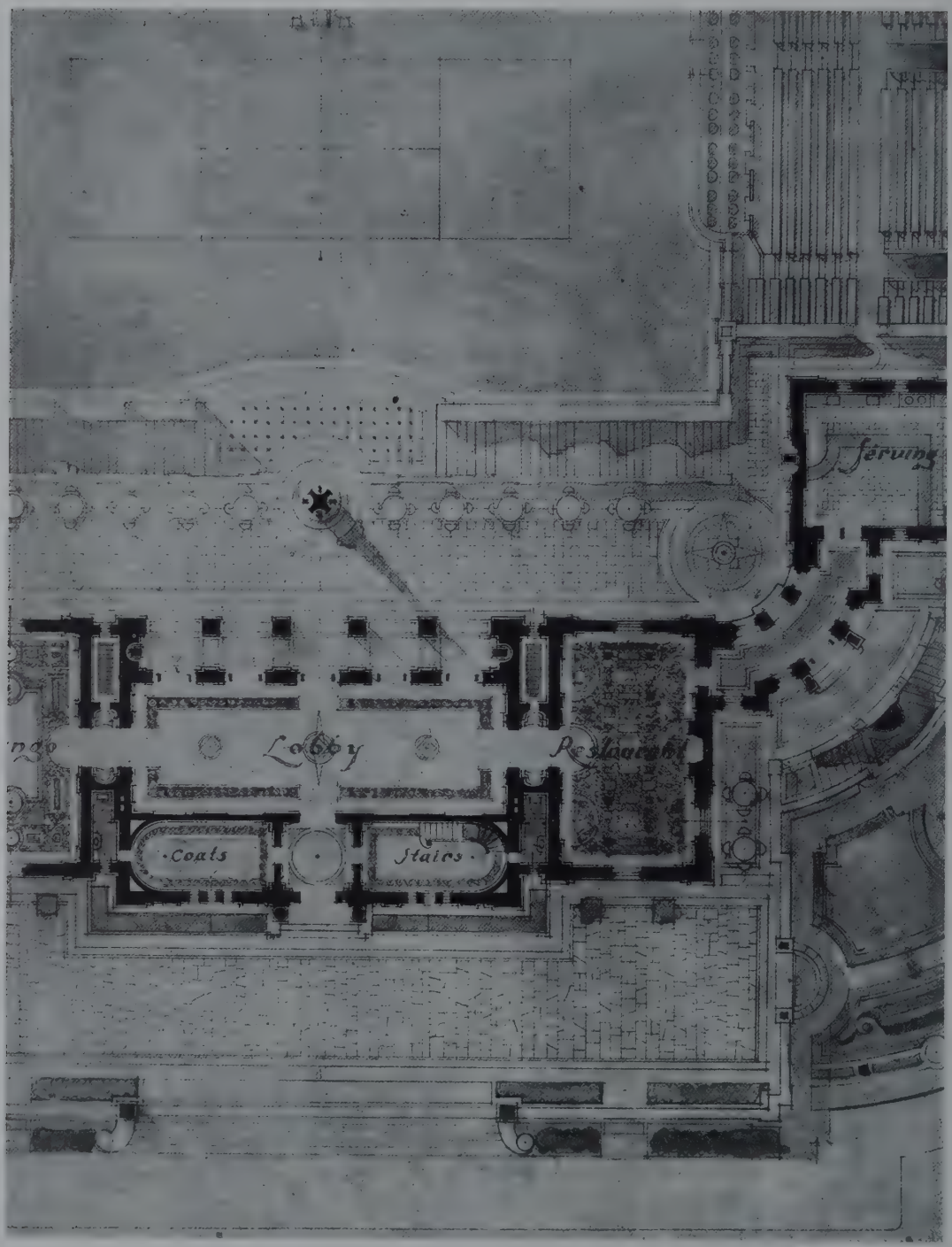

Figure 301. Design by Roy F. Larson for a Tennis Club. Portion of plan reproduced at the actual size of the original drawing.

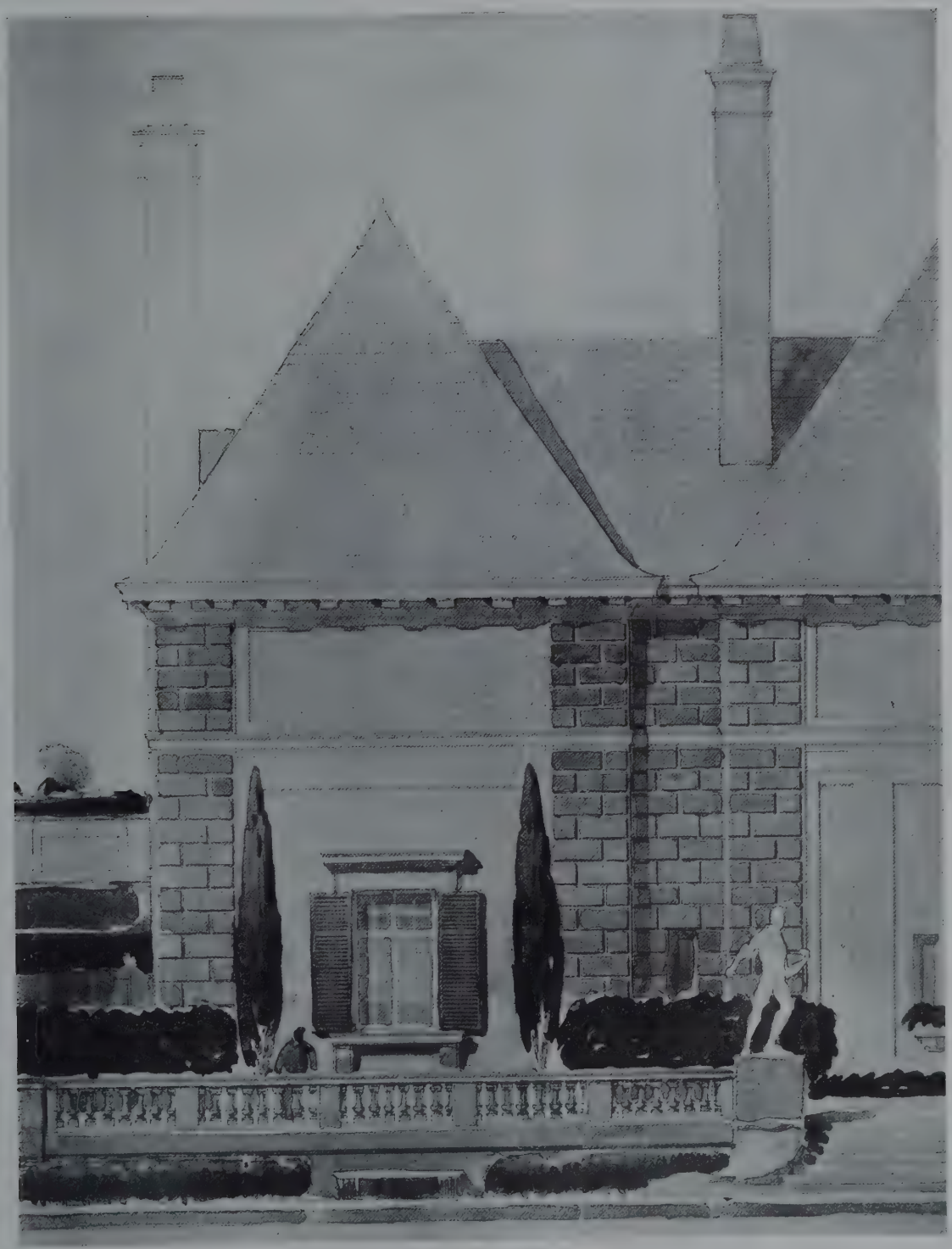

Figure 302. Design by Roy F. Larson for a Tennis Club. Portion of the elevation reproduced at the actual size of the original drawing.

Figure 303. Design by M. D'Amato, Pupil of M. Laloux, for "La Sortie d'un Chemin de Fer Métropolitan."

(Figure 138, the building at the top of the plan). Some of these were exceedingly well drawn and presented. But there was one problem in which this requirement of the program, that the room be as large as possible, had been frankly met. The board or exchange room extended from side to side of the building, and from the back fully three-quarters of the distance from back to front. It was distinctly a *large* room—as large as could possibly be put on a lot of the size given, covering all of the area of one floor except such as was required for stairs, elevators and minor services as must necessarily be on the same floor. The committee rooms and offices were on a mezzanine floor below. The parti was decidedly original, it was a distinctly good solution of the program. But it was presented almost as a sketch problem (it was, in fact, done in a little over a week). The jury awarded it a second medal only, the presentation and study not being adequate for a higher award, but no other medals were given.

But there are times when good draftsmanship has a distinct value. The late Frank Miles Day, a past president of the American Institute of Architects, who had served as a juror in many architectural competitions, once said that there was one thing a very good—a careful—drawing did do in a competition: it ensured the very careful consideration by the jury of the scheme so well expressed. He was speaking of professional competitions, rather than student ones, though he served many times in competitions of each kind, and they are approached in much the same way by a jury. It is in competitions, in fact, that careful drawing repays all the effort expended on it, especially in prize competitions and competitions for travelling scholarships.

Where two competitors have hit upon the same parti, and it sometimes happens that there is only one satisfactory solution to a problem, it is easily seen that the way in which this solution is drawn and rendered takes on a new importance. In such cases the result frequently is that the award is made to that competitor who has finished all of his drawings—plan, elevation and section—equally well; such a presentation winning over the work of students who may be more clever, who may have presented the elevation, usually the showy drawing, much better than the winner, but have left the other drawings, particularly the section, in a very sketchy form. This gives evidence of haste, and, in the opinion of most juries, of a lack of judgment in disposing the available time among the drawings required. Juries awarding a travelling scholarship often seem to hold the opinion that a man who carries all his drawings forward equally and presents them all with the same completeness, will show the same efficiency in disposing of his time while travelling, and that the student who has shown greater cleverness in one drawing, leaving undeniable earmarks of haste on the others, would not dispose of his time and money as well. This has happened so frequently in such judgments that it seems to be part of the psychology of judging—it seems to illustrate an invariable tendency.

This is markedly true of such a prize competition as that for the Emerson Prize, where usually the parti called for is very simple. As both documents and criticisms are allowed for this problem, it can easily be seen how much importance the jury *must* place on drawing and rendering.

So it is quite natural that a man competing for a foreign scholarship, a thing that will give a new meaning to his whole life if he wins, will be tempted

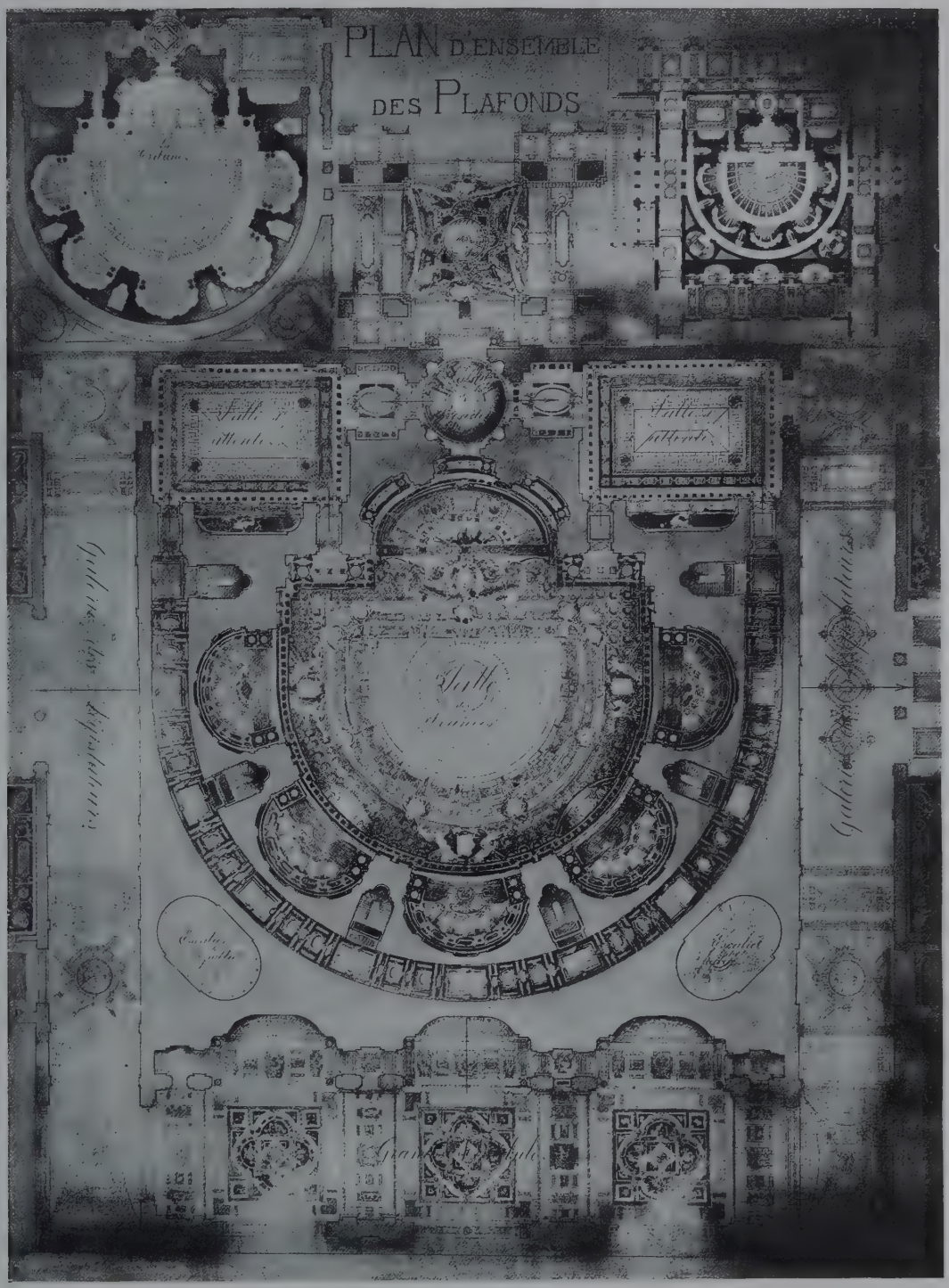

Figure 304. Design by M. Castel, Pupil of M. Bernier, for "La Salle d'un Palais Législatif."

to send in the best possible drawing hoping that should the judgment narrow itself to considering his drawings and that of one other, and *parti and other things being equal,* the excellence of the drawing and rendering, of the "technique" in short, will pull the balance in his favor.

In cases where only one parti is possible, the design of the *parts* of a composition at once gains in importance: the study of small parts of an architectural design frequently depends on good draftsmanship. The flattening of the projections of pilasters to gain refinement; the study of profiles, the appropriateness of ornament, and the design of the silhouette of free ornament such as figure sculpture in the round, all depend on the ability to make drawing express slight differences in the quality of form.

Figures 301 and 302 are small portions of Class A drawings—plan and elevation. They are reproduced at the actual size of the original; they do not seem overly careful; yet the general effect of these drawings when seen in their entirety was that they were painstakingly neat and carefully rendered. Of course, what constitutes "good" drawing depends somewhat on the problem. A seventy-two hour sketch problem (Figure 305) will be called good drawing with a very different standard from that used to judge a finished projet (Figure 304). And this, in turn, seems careless indeed when compared to such drawings as are submitted in many of our American competitions—professional competitions (Figure 299)—which are frequently drawn with incredible care and skill.

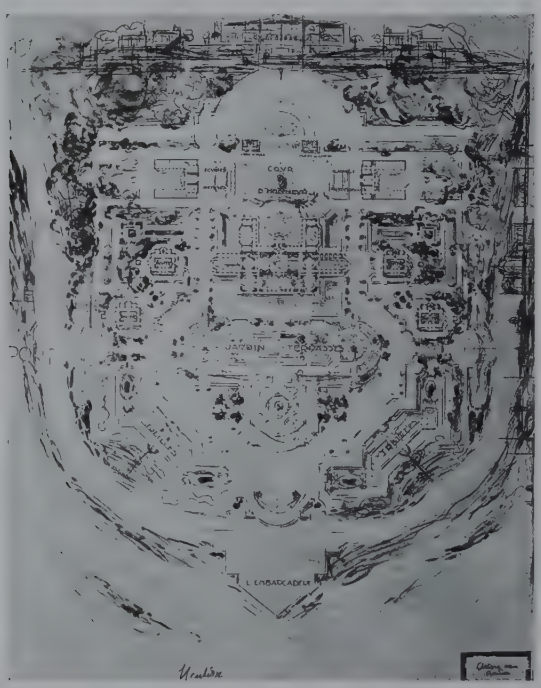

Figure 305. Design by Albert Astorg, Pupil of M. Bernier, for "Une Residence Pour un Chef D'Etat."

Figure 306. Design by Irwin Clavan for "A Naval Pantheon," Class A Projet.

What is important is that the designer shall be able to express with conviction anything that his imagination can conceive. This requires a great degree of skill in *freehand* drawing. If a man has gone as far as Class A and cannot draw freehand work convincingly it would be worth his while to stop his work in design long enough to put in some time in intensive training in freehand, drawing from the antique—from casts of ornament and the figure—and from life. This can be *supplemented* but not replaced by outdoor sketching from nature. Valuable as this is, it cannot be compared as a method of training with the more arduous, perhaps less interesting, study in pure drawing to be had from the cast and from life.

In sketching outdoors as many different types of subjects should be chosen as possible, if the aim is to improve architectural draftsmanship—not with the idea of collecting a number of copy forms to be used in rendering, but to build up the power of visualization.

It is possible to make studies of trees, vertical trees like Lombardy poplars, spreading trees like elms, and the rounded apple tree forms. Then, too, clever studies of a single limb, the studies of the silhouette of groups of leaves close to the eye may be tried (Figure 303). These can be made in two and three hour sketches; they can also be made in rapid sketches where an effect is quickly obtained by simple means (Figure 307). Studies of rocks, hills and mountains are frequently of great use in

presentation (Figures 300 and 306); even such things as small stones, a few leaves lying on the pavement, and tree shadows on the ground are used by such able renderers as Jules Guerin, Birch Burdette Long, and Otto Eggers, to "compose" a drawing.

It has often been said that "talent is nine-tenths hard work", or words to that effect. As with most proverbs and sayings, there is some truth in this, along with many implications that are not so true. Ability in *architectural design* depends quite a little on inherited tendencies, and only to a lesser degree on hard work. But one phase of architecture in which hard work will make for talent—if by talent we mean a successful issue to continued effort—is this very matter of good drawing. If one is but honest enough to admit the faults in his drawing and presentation—big enough to see the faults—and will study documents of presentation assiduously, and will then make sufficient studies to translate that research into self-expression, proficiency will result.

Anyone can improve his skill in draftsmanship if he is willing to make the effort, if he can keep himself at a course of training to that end. One way is to try different mediums of expression—pencil, pen and ink, monotone, and color, and then back again to India ink. To try to present the same objects in these different expressions will give many new ideas—will form a deeper vision, a clearer visualization.

Figure 307. Design by Haffner, Pupil of M. Laloux, for "Un Rendez-Vous de Chasse."

Figure 308. "Un Pavillon pour Une Source d'Eau Thermale." By M. Carlu, Pupil of MM. Duquesne and Recoura. Ecole des Beaux Arts, Paris.

THE SKETCH PROBLEM AND PRIZE PROBLEMS

Chapter XXXII

THE SKETCH PROBLEM

THE schedule of the Beaux-Arts Institute of Design has not only the "projet," but there is also the "esquisse-esquisse", or sketch problem. The "projet", we have seen, is a problem for which from three to six weeks' time is allowed. For this problem a scheme or "parti" is set down in sketch form in the "esquisse"; this "parti" is then developed and studied by means of many successive drawings under the guidance and regular criticism of the Patron, and then the solution is presented in fairly elaborate, careful and well rendered drawings. For the projet, documents and information of all sorts are used in the study.

The sketch problem is quite different. It is done in a few hours—usually only nine—and without criticism or advice, or the use of documents; within these few hours there must be formulated a solution to a program—like the esquisse for a regular projet; but unlike the esquisse this solution must be "presented", that is, rendered to give an effect.

As we have said before, making the esquisse for a projet develops the power of quick, right thinking, for one soon learns that with an esquisse that does not contain a solution to a problem, no amount of care or study in presentation will make a first class projet. The sketch problem develops this same faculty, for here again a solution must be found for a problem, and only a small portion of the nine hours can be used for finding a parti. Therefore a *good* parti must be found *quickly*.

Sketch problems may be roughly separated into two divisions, of which the plan sketch problem is mentioned first because it is the more important and the more difficult. In these problems elevation and section are explanatory only. There are a few plan sketch problems in Class B. In Class A, there are many and these are elaborated; and they become quite complicated—difficult—in such competitions as that for the Warren Prize, for which a longer time is given, it is true; in this competition criticism and documents may be used, however. This type of problem culminates in the Second Preliminary Competition for the Paris Prize, a twenty-four hour sketch problem that is a severe test of ability in thinking out a scheme—solving a problem—and in presenting it in a telling way. We shall consider the plan sketch in the next chapter.

The other type is the decorative sketch problem, usually requiring an elevation or perspective of a small composition with an explanatory plan at small scale. This starts in Class B with such simple problems as those shown in Figures 310 and 311, includes the Spiering Prize Problem (Figure 320), and is continued in Class A with more complicated problems of a similar nature, such as Figure 316, and in such problems of interior decoration as Figures 318 and 319. The Pupin Prize problem is of a decorative nature; for this, like the Warren Prize, more time is given and criticism and documents may be used.

Figure 309. Class A Esquisse-Esquisse, "The Entrance to a Dance Hall," by R. S. Potter, Atelier Cret, University of Pennsylvania.

The First Preliminary for the Paris Prize is a problem of this kind—a test in the handling of the elemental forms of architecture, of good proportions, and in presentation — Figure 315 and Figure 317. Those who go to Paris to take the regular examinations for entrance to the Ecole, find the test in design is a problem of this sort (Figures 313 and 314). In these a direct eleva-

Figure 310. Class B Esquisse-Esquisse. "A Real Estate Office in The Country." By G. Gonzalez, Atelier Hirons, New York.

Figure 311. Class B Esquisse-Esquisse. "An Artist's Studio." By Paul R. Williams, Scarab Prize, Atelier Los Angeles.

tion, a plan and a section of some small architectural form are required. The authorities of the Paris school thus make proficiency in the sketch problem a requisite for entrance to the school—for any further study. As only a definite number are admitted to the Ecole, and as those who fail at one test usually try again at the next examination, the competition becomes very keen; so keen, in fact, that there are various ateliers in Paris that are filled with men preparing for this examination, taking sketch problem after sketch problem on programs similar to those used for the entrance examinations, so that when they come to take the examination itself they have learned just what to do to use their time to the best advantage.

The sketch problem forms habits of quick thinking; it also develops facility in presentation, and both of these are of great value in work on the projets. It is a necessary part of any student's training, doubly necessary if one hopes to become a logist for the Paris Prize, the surest test of proficiency in Beaux-Arts training. If a student ever expects to enter the first or second preliminary competitions, he must take as many sketch problems as possible. One cannot make a good sketch problem at the first attempt—to do them well means to do them often, for this is the only way to learn how to make the most of one's time: how much time may be used for finding a scheme, and still leave enough for the presentation. These things cannot be determined while doing a sketch problem; there is not sufficient time. It is a mistake to think of the sketch problem as a matter of trickery, of indication; but there are conventions and methods of presentation that are different from those used in a regular problem, and these must be learned—the technique of the sketch problem.

Usually if you have an idea you can visualize it —can see it among a few lines on the paper. But it will take more lines to express this idea to some one else, and more and more lines—up to a certain point—will help to express the idea to an outsider. Beyond this point more lines will only complicate and confuse the idea. The esquisse-esquisse must make a picture. It must also express your idea, your solution of the program, to some one else—to a stranger.

There are two things we must do then. First, we must conceive a solution to a given problem—quickly; second, we must "get it across"—present it in a convincing way in an incredibly short space of time.

Let us consider the decorative sketch problem; a man who has done a number of them usually has evolved a system, a technique of his own, based on his knowledge of his own talents and ability, that works out well for him, and brings results. If it does not do this, he will be willing to consider trying other ways of doing it. And the man who has done few sketch problems may find a great deal of value in a method of procedure that will help him arrange his time and use his talent to the best advantage until such time as he will have developed his own "system." If we take a Class B sketch problem then, such as "A Real Estate Office in the Country" of Figure 310, it is well to do it in the following way outlined, remembering that we start with an empty paper and a program, and must turn in,

Figure 312. Esquisse-Esquisse, "A Gate Lodge," By Lionel Prics, University of Pennsylvania.

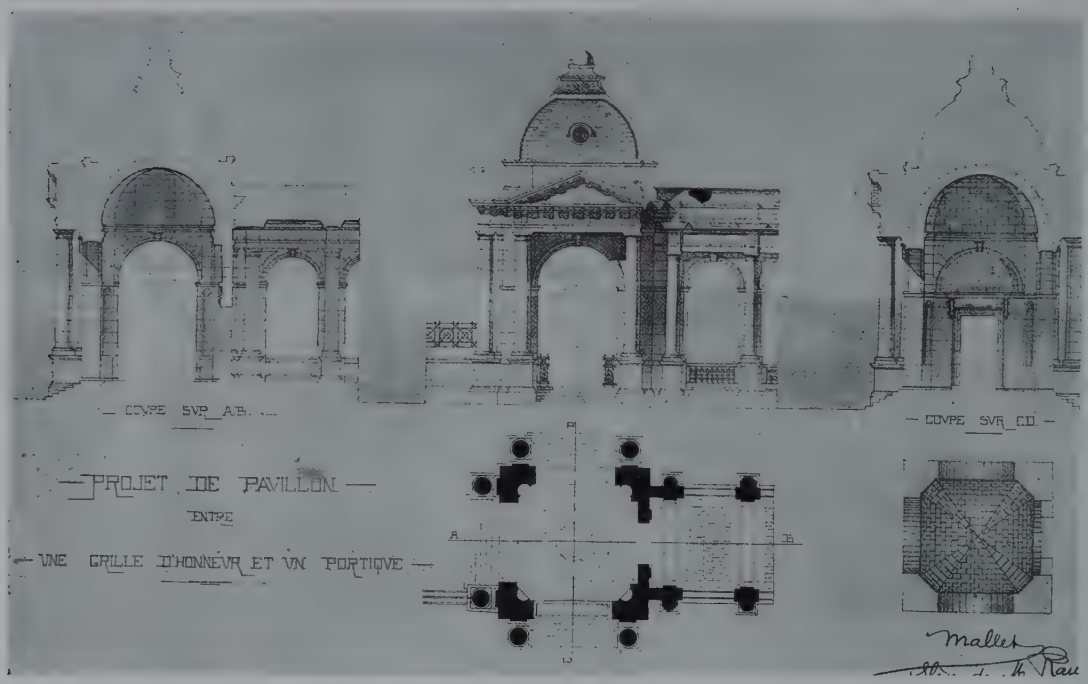

Figure 313. Admission Drawing, Ecole des Beaux Arts, Paris. M. Mallet, Pupil of M. Raulin.

Figure 314. Admission Drawing, Ecole des Beaux Arts, Paris. M. Dassier, Pupil of M. Laloux.

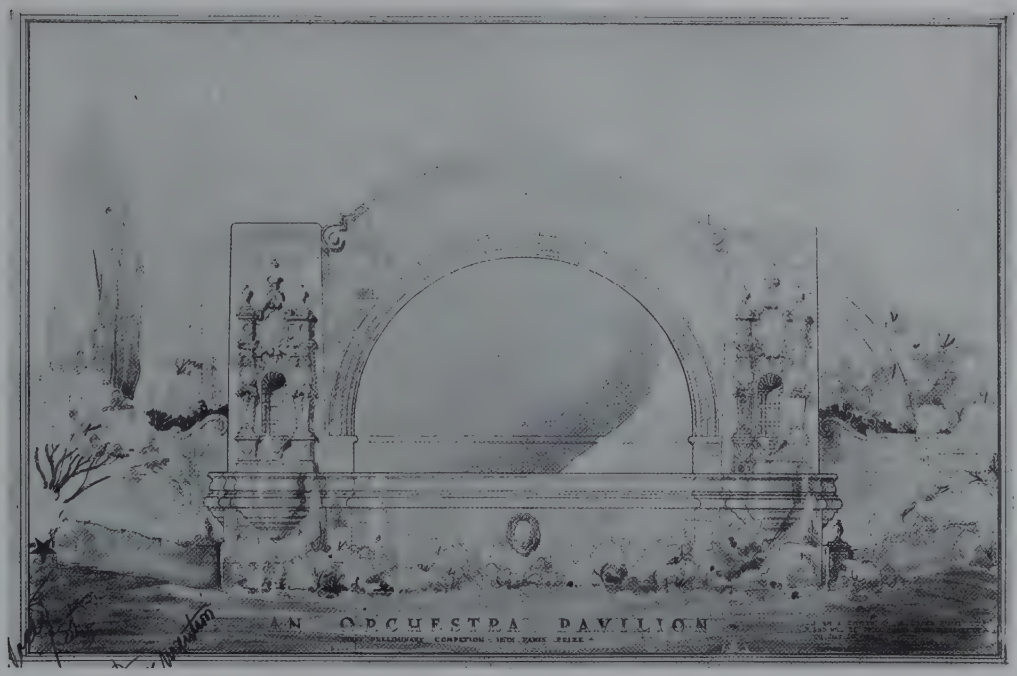

Figure 315. "An Orchestra Pavilion." P. O. Davis, Los Angeles Architectural Club. 1st Preliminary Competition for the 16th Paris Prize of the Society of Beaux-Arts Architects.

nine hours later, a well presented solution to the problem.

We speak of the Class B Esquisse-Esquisse, for the Class A sketch problems are a part of a progression; it is best to start with the Class B sketches and work through those in Class A to the prize problems; do not hesitate to try for these prize problems as soon as you are eligible. One seldom wins one of these prizes on the first trial—by the time he is making his second attempt he knows better what is wanted, and is more able to dispose of his time to advantage.

First, it is needless to say, a man's "kit" must be ready beforehand—pencils, erasers, water-colors, transfer paper, the final paper or board, T-square and instruments, and so forth. No time can be taken from the nine hours for this purpose.

Then, read the program, and re-read it as often as necessary to understand what it is all about,—what are the important requirements, what is to be the character. You must form a picture in your mind of what you are after, of the solution as a whole without thinking of details. Next you must find out what are the strokes and lines that will bring out this character.

People use different language to express thought; draftsmen use different mediums to express an idea. Any of these mediums will be good if it will express the thought; but certain things are essential in a good sketch problem—you must fill the paper, or, to put it in another way, you must compose the sheet. The lines on your drawing must not lead the eye out of the picture, but should focus it on the thing that is to be seen; the sheet must always count as a sheet—as a whole. Decide beforehand what medium you will use, so that you will not waste part of the nine hours to make this decision. It is wise to find out in your early sketch problems what is your best medium—and then use it and become proficient in it.

It is important to get the proper scale: mark in the corner of the paper a drawn scale to keep it in mind. Once you have it in mind you will not need again to use a scale.

Now, as to the division of your time. How long shall you study the program, how long study at a small scale; when is the proper time to start the final drawing? Each man has a different way of working; some can speed up more effectively in the early stages of the process, and are sluggish in the actual drawing; others will be the reverse. After making a few sketch problems you will begin to understand your own characteristics in this. Until you "know yourself," keep at least six of the nine hours for the final presentation. It is most important to have plenty of time for this, for *whatever else a sketch problem must be, it must be completed when the time is up.* No matter how good your idea, unless it is adequately presented it will not interest the jury.

In presenting this idea, detail—carefully drawn detail—is not necessary. All detail is indicated, but it must look like something,—must be reasonable. The Class A sketch problem shown in Figure 309, shows a very free indication of detail, quite different from that of Figure 312, where everything is drawn,

Figure 316. "A Gallery Over a River." D. M. Allison, University of Illinois.

Figure 317. "A Private Library." E. L. Babitsky. John Huntington Polytechnic Institute.

Figure 318. "A Reception Room on a Pier". E. L. Babitsky, Atelier Wynkoop, New York.

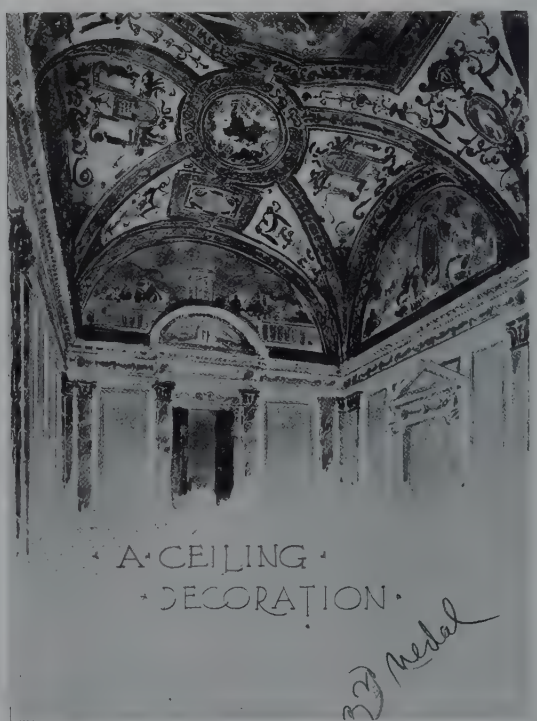

Figure 319. "A Ceiling Decoration." T. E. Ash, T-Square Club, Philadelphia, Pa.

rather than indicated, although drawn free-hand. One thing which is important in the sketch problem, as in any composition, is to have a dominant feature, and I mean here a dominant feature on your sheet arrangement, quite aside from the design of the piece of architecture which is being presented.

This sheet arrangement must not be left to chance —it must not just "happen" from a setting down of a solution to the problem. It must be visualized and arranged. When a student has formed a scheme and put it on paper, he must then act as the Patron and criticize his own drawing with this viewpoint of getting an effect—of arranging the drawing on the paper. A few rapid sketches in charcoal or soft pencil on tracing paper, made over his solution, will at once show one arrangement as better than the others. Without this conscious effort for a good presentation it would be only a question of chance whether or not the first arrangement tried would be that best one to be found.

A study of the examples shown here, as well as of the premiated work published after each judgment, will be of great value. It is interesting to compare these with the French example shown in Figure 308—a sketch submitted in the first preliminary for the Prix de Rome at the Ecole des Beaux Arts. But, after all, to *do* a good sketch problem, one must *have done* sketch problems,—the more the better.

Figure 320. "The Garden Façade of a City House". C. B. Lewis, Yale University.

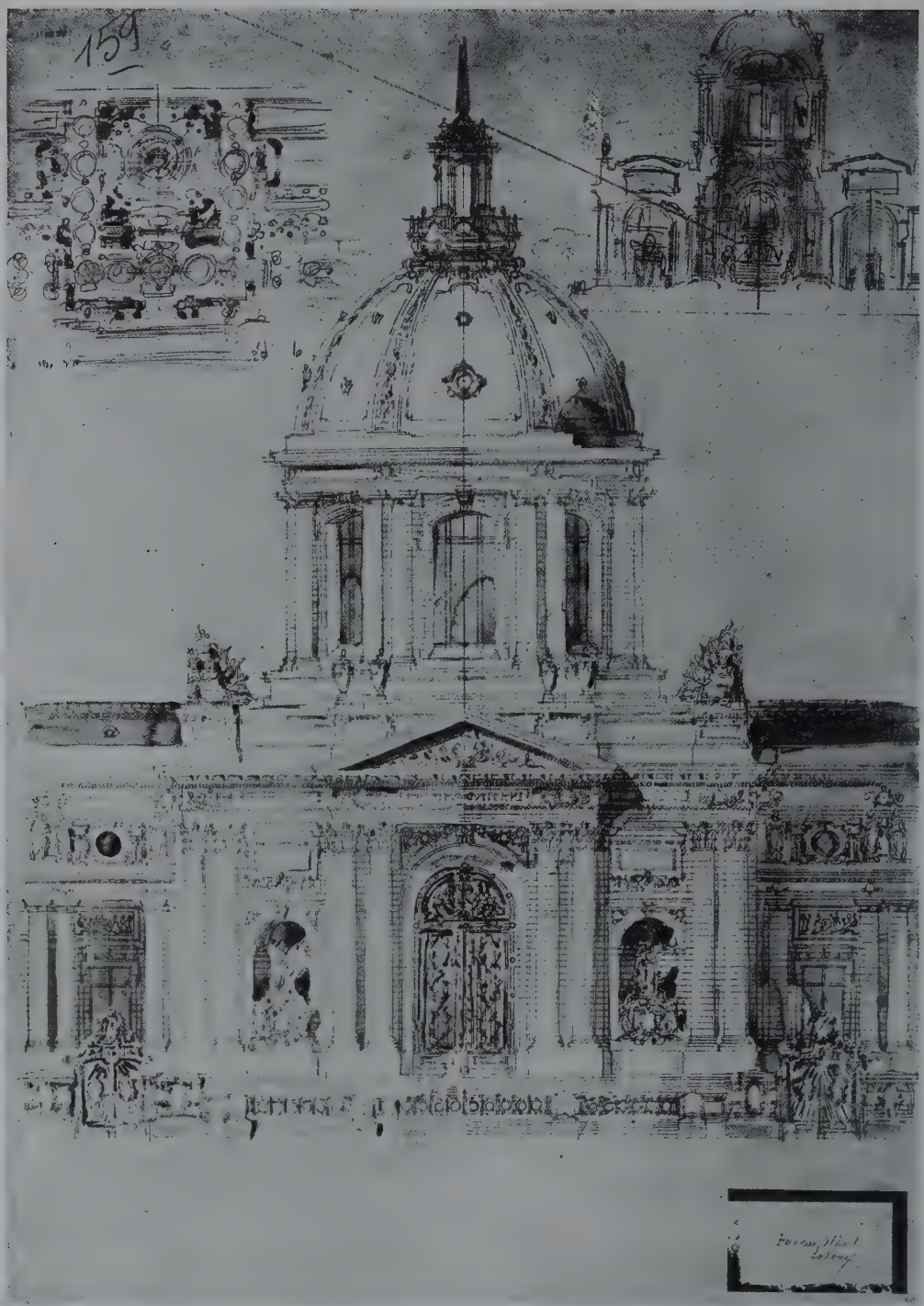

Figure 321. Design by M. Albert Ferran, Pupil of M. Laloux, for "Le Pavillon Central d'un Palais de l'Institut." First Preliminary Competition, Prix de Rome, Ecole des Beaux Arts.

THE SKETCH PROBLEM AND PRIZE PROBLEMS

Chapter XXXIII

THE FIRST PRELIMINARY COMPETITION FOR THE PARIS PRIZE

THE First Preliminary Competition for the Paris Prize is different from the regular sketch problem in one important particular—only five out of the drawings submitted are placed. It is not enough to make a good sketch—it must be one of the five best, and as the competition is keen this sometimes results in an exceedingly high standard. And just as in sprinting, if you seriously intend to win a race in a meet, you will go into regular training to develop your muscles and your control over them, and to increase your "wind," so that by the date set for the race you are absolutely "in condition;" so, too, it is possible to train for the Paris Prize preliminary.

This can be done by taking a problem each week, for a number of weeks—programs of former preliminary competitions may be used. Most of these have been published in the architectural magazines and may be found in the reference libraries. Take the problem in every respect—except one—as if you were taking the preliminary itself; work "en loge"—that is, use no documents, no criticism, no help. The exception mentioned above is as to the time. It might not be possible to take a number of such problems in the time usually allotted to a Paris Prize preliminary, if the whole number of hours had to be spent consecutively, without undermining one's health to such an extent as to jeopardize the chances for success in the event itself.

This would apply more particularly to the second preliminary, a twenty-four hour problem: it is even more necessary to "train" for the "second prelim," and training by means of a number of similar problems is of even greater value in this case. But just one twenty-four hour sketch problem is a severe strain on one's stamina because of the intense nervous effort required, to say nothing of the loss of sleep and lack of regularity in eating; a series of such efforts would be ruinous to the stoutest constitution. A glance at some of the successful problems in these competitions, of which Figure 323 is an example (by D. M. Kirkpatrick, winner of Paris Prize, 1912), will show that to draw as many individual lines as are shown, necessitates a high average of lines per minute in the time left after the parti has been found and studied, and the arrangement of the masses, of the axes, and the character of the representation have been decided upon.

For these training problems it is sufficient to use the proper number of hours, and not to use them consecutively—to divide this number into shorter periods so that the usual habits of life are not disorganized and nervous vitality is not dissipated.

If you can get some one else to go through this training with you, there will be an added benefit for both in development: the more the better.

After each such trial get what criticism you can on your effort—from the Patron, from men who have had the Beaux-Arts training, and especially from "logists" in a previous Paris Prize competition, who, therefore, have had some success in preliminary competitions. Look, then, at the published solutions of these former programs: incidentally you should not look at these solutions before making the esquisse—that is, if you expect to get any real value from the effort.

With such a method of training you will be astonished at the improvement in your own work after taking ten or twelve problems of this kind.

And when you come then—after this training—to take the preliminary competition itself, make use of this training as much as possible. Stick to the technique, the medium, you have found greatest success in using; watch the disposal of your time so that the preliminaries (the finding of a parti, the study of the composition of the sheet, the blocking out of the masses of your solution) will not eat too much into the time necessary for the presentation.

And in this final effort—the preliminary competition itself—you must drive yourself hard, use every pound of "steam" you have to get the best that is in you "across." This is no time to pamper yourself, to hang back from a supreme effort; rest tomorrow—eat tomorrow—play tomorrow. Today get the thing done, and get it done well, just as well as you are capable of doing a thing of this kind.

And if you miss it, if you do not "place," do not forget that there is another competition a year later, and start in at once to get ready for it, to "go in training" so that the result will be different in that competition.

It is interesting to examine the problems which have been "placed" in a Paris Prize Competition. That shown in Figure 322, also by D. M. Kirkpatrick, shows the value of directness, especially in the plan. Everything is "nailed out;" there is no indecision anywhere. In any good sketch you see evidence of the attitude that, once the design has been decided upon, there is never again any hesitancy about design or parti; they are accepted as good, and presented as directly and forcefully as possible. In this case (Figure 322) center lines and snap lines are partly responsible for this feeling of directness, and the use of T-square and triangle is much in evidence. Figure 317 is very similar in draftsmanship and indication. Both of these are decidedly deserving of the name "sketch."

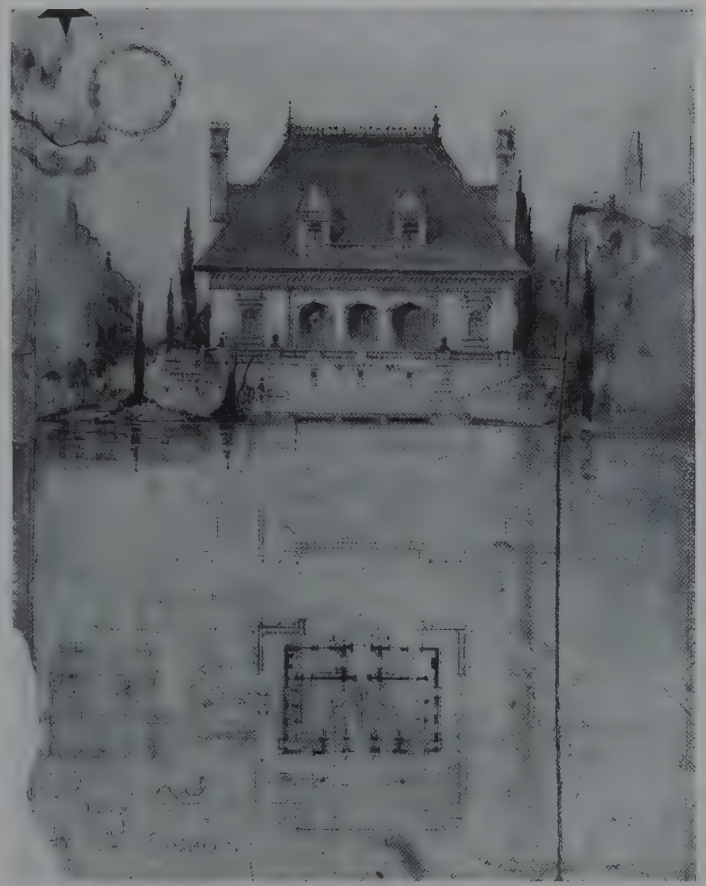

Figure 322. Design by D. M. Kirkpatrick for "A Water-Gate in a Park." First Preliminary Competition for the Paris Prize, 1912. Placed 2nd for Second Preliminary.

Figure 323. Design by D. M. Kirkpatrick for "The Court of Honor of an Exposition." Second Preliminary Competition for the Paris Prize, 1912. Tied for 1st Place in Second Preliminary.

Figure 324. Design by Louis C. Rosenberg for "A Church Façade." First Preliminary Competition for the Paris Prize, 1920.

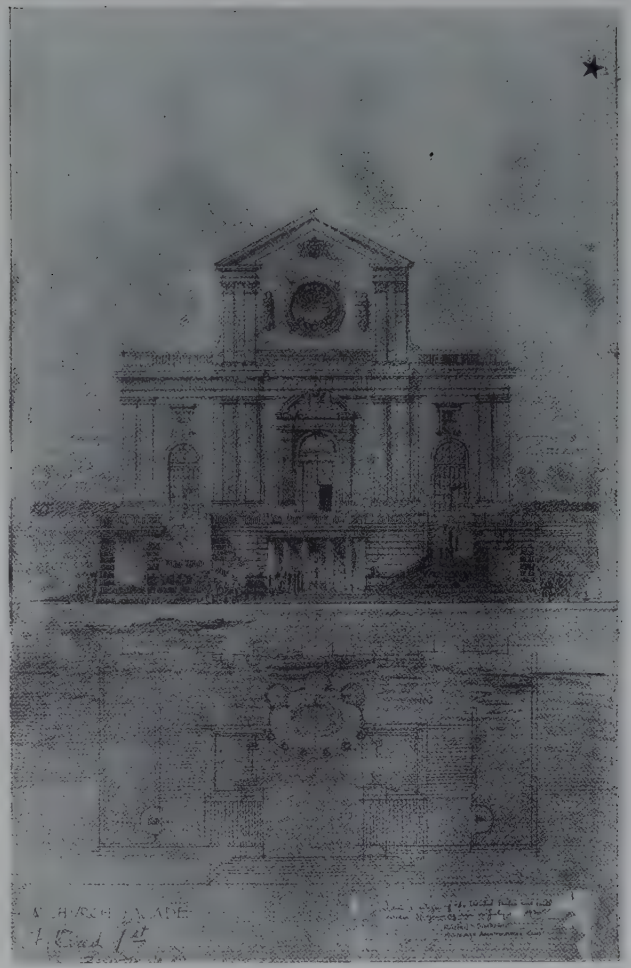

Figure 325. Design by Russell S. Simpson for "A Church Façade." First Preliminary Competition for the Paris Prize, 1920.

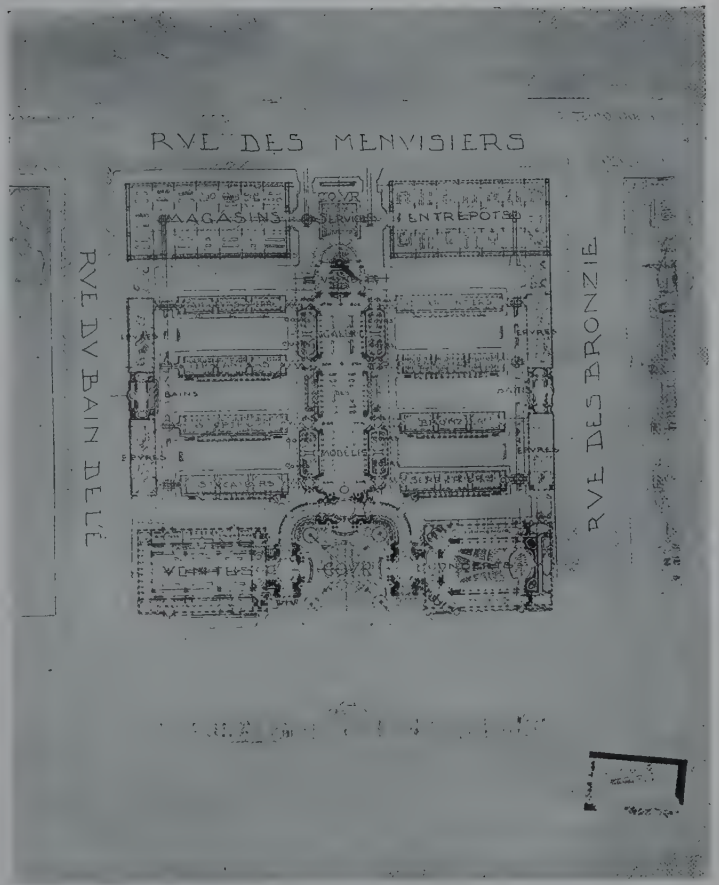

Figure 326. Design by M. Chaurés, Pupil of M. Pascal, for "Une Ecole Professionelle d'Apprentis dans Une Grande Ville," Twenty-four hour sketch problem. Ecole des Beaux Arts.

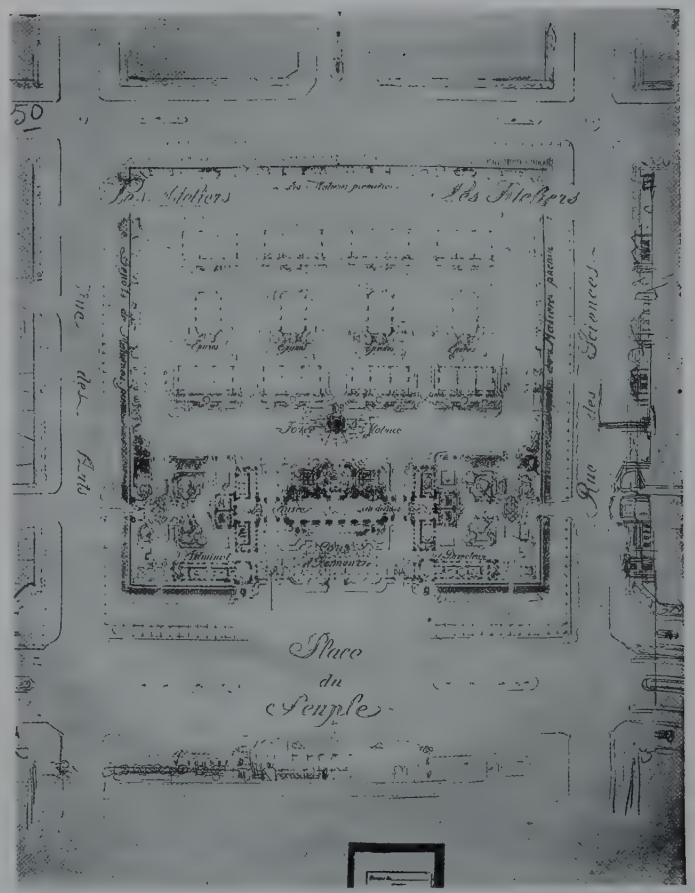

Figure 327. Design by M. Tournon, Pupil of MM. Sellier de Gisors and Bernier, for "Une Ecole Professionelle d'Apprentis dans Une Grande Ville." Twenty-four hour sketch problem. Ecole des Beaux Arts.

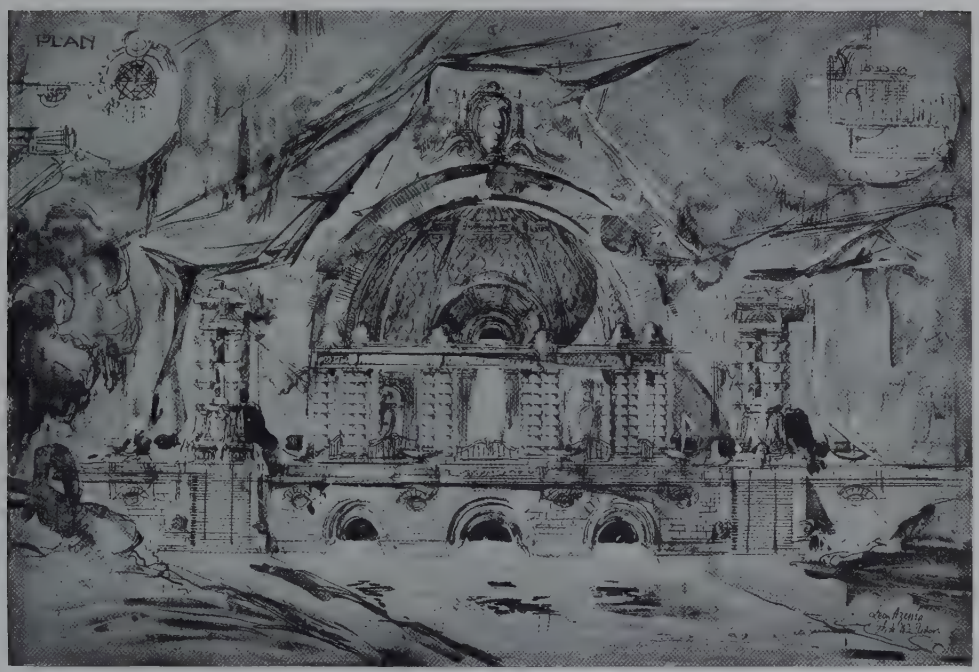

Figure 328. Design by M. Azéma, Pupil of M. Redon, for "Un Monument à la Source d'un Fleuve." First Preliminary Competition, Prix de Rome, Ecole des Beaux Arts.

Quite different is Figure 315, which, although a successful preliminary first entry, looks much like a finished drawing, the lines are so carefully indicated, the profiles and intersections of lines so neatly drawn. But this was a simpler problem, and the parti chosen was a simple solution for this program. This made it possible to spend more time on the presentation, which has been very effectively done and with a great deal of cleverness, even though at first glance it seems quite simple.

Half way between these as to care of draftsmanship, but equally effective as to the success of its presentation, are two of the successful drawings in the first preliminary competition of 1920, "A Church Façade," Figures 324 and 325.

It is interesting to compare these with two rather similar French examples submitted in the First Preliminary Competition for the Prix de Rome at the Ecole des Beaux Arts, Figures 321 and 329, for "Le Pavillon Central d'un Palais de l'Institut." Each of these is more decidedly a sketch problem than the American examples.

Even more distinctly partaking of the sketch problem idea are two other first preliminary drawings at the Ecole, for "Un Monument à la Source d'un Fleuve," Figures 328 and 330. And yet how much these differ from each other! The latter is full of hard lines—the T-square and triangle are very much in evidence, with free-hand used only for ornament within or against hard lines. In the former there is little evidence of the T-square and triangle—only a few big axis lines have been laid out mechanically, while everywhere are free-hand lines. Yet each is equally successful in expressing a solution of the program; each was chosen to enter the second preliminary competition.

It is interesting to note that there may be the same variation in good plan sketch problems. Figures 326 and 327 were solutions for "Une Ecole Professionelle d'Apprentis dans Une Grande Ville," a twenty-four hour sketch problem. That by Chaurés (Figure 326) is mechanical in its technique (though not in its final appearance), most of the lines have been drawn with T-square and triangle, even much of the smaller indication was done mechanically, and this assemblage of mechanical lines is then dressed up with free-hand work. Tournon's solution (Figure 327) shows a use of T-square and triangle for only the first layout of the lines—the final presentation is apparently all free-hand. And both of these problems were good; both of them were premiated.

This only goes to show that there is no one way of doing a sketch problem, no set formula; and that each man as he "arrives" adds his own personal touches to the different kinds of good presentation, even though he may have used ideas from one person here, from another there. In fact, the more he gets from many different men, the more apt is his own work to be personal, as being not too much like any one of them.

But in any case, whatever medium you use, whatever style you develop, you must present a clear "picture" of your idea. The time is short and your efforts should be concentrated on the presentation of the one idea.

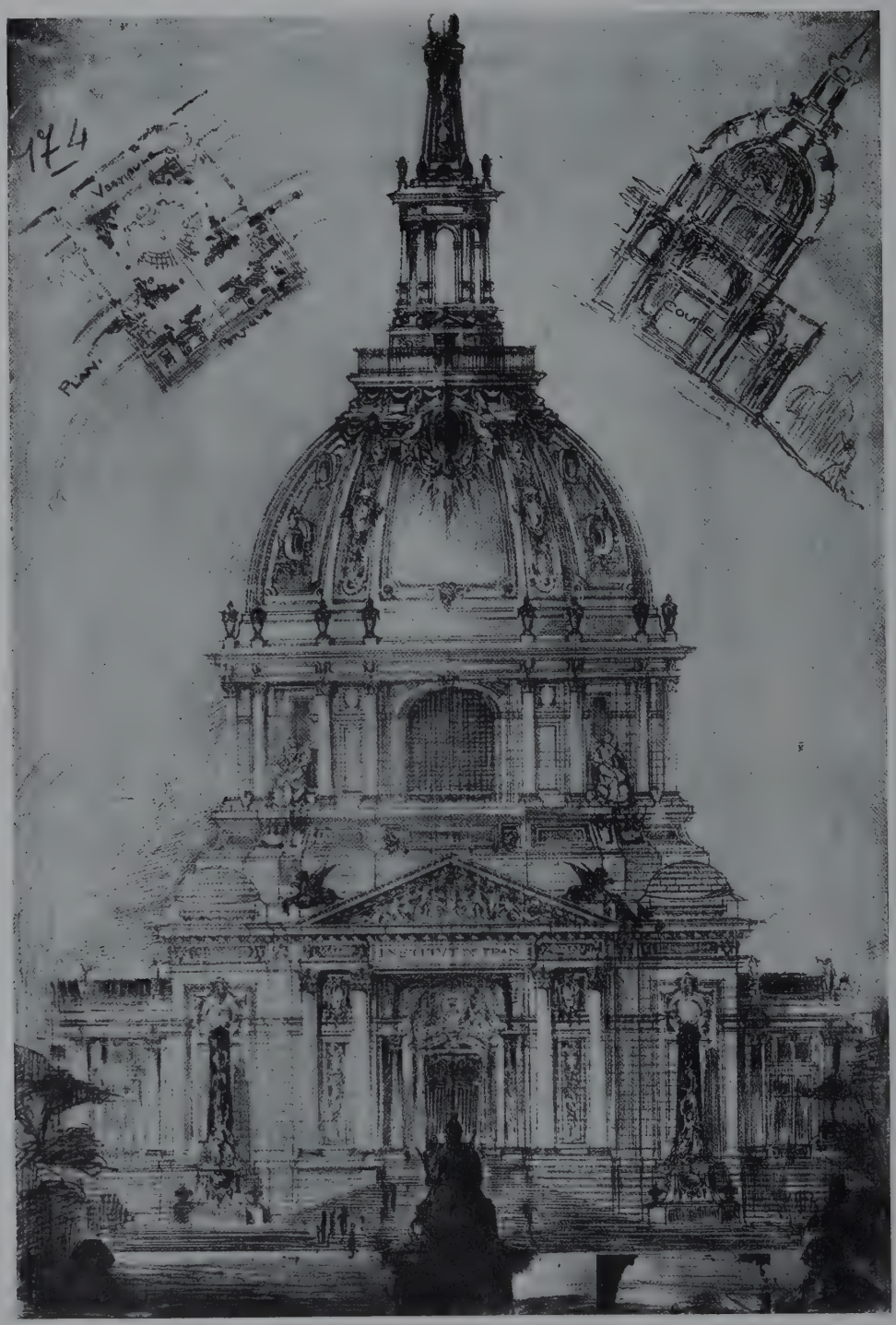

Figure 329. Design by M. Courrèges, Pupil of M. Bernier, for "Le Pavillon Central d'un Palais de l'Institut." First Preliminary Competition, Prix de Rome, Ecole des Beaux Arts.

To bring this to a focus, let me sum up these points:

To do a good esquisse-esquisse it is necessary to have a good parti: by taking these practice sketch problems you will develop the ability to formulate a workable parti quickly.

By constant practice learn how to limit yourself to a specific period of time to every part of the problem, from the time you start to the time of finishing.

Study the work of others, to take from it that which may best be incorporated into your own ideas —as to parti, and also as to methods of handling a problem, manner of indication, little points in drawing and rendering and the handling of washes to accent the salient points in a plan.

The old adage of practice making perfect is applicable in this case: the more you practice, the more you will develop your ability to do a good esquisse-esquisse. Like a good boxer, whose arms instinctively fall into the proper defensive position at each move of his adversary, you must have your system arranged in your mind so that when you come to the test you will respond instinctively, and so go through the work with the minimum of effort.

This method is not an original one—that it is a good one is proved by the fact that it was used with a successful conclusion by Kirkpatrick (1912), Simon (1913) and Sternfeld (1914).

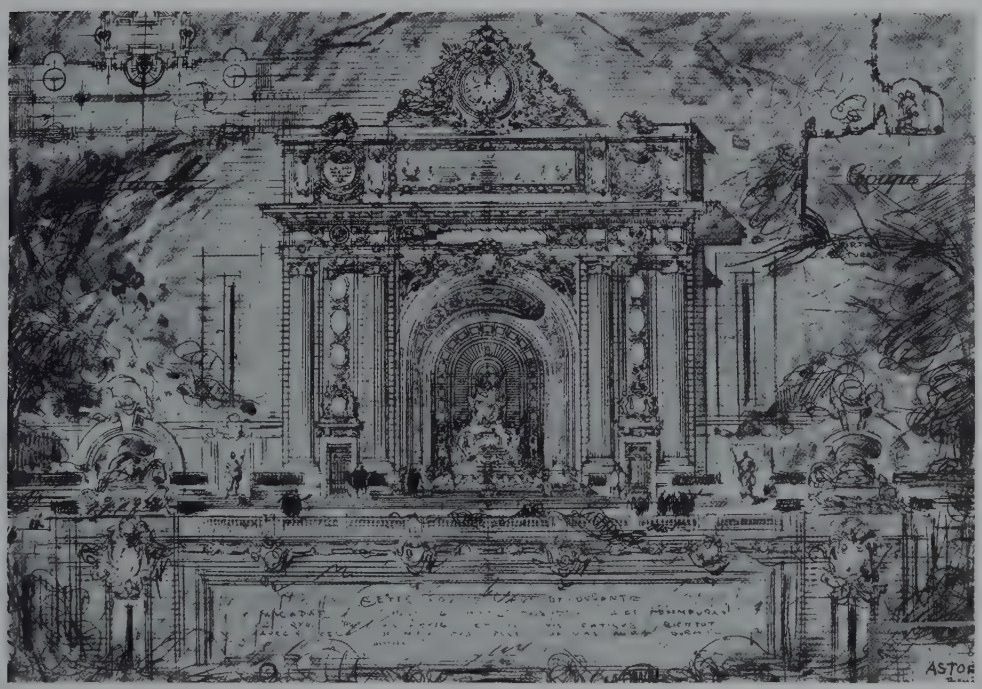

Figure 330. Design by M. Astorg, Pupil of M. Bernier, for "Un Monument à la Source d'un Fleuve." First Preliminary Competition, Prix de Rome, Ecole des Beaux Arts.

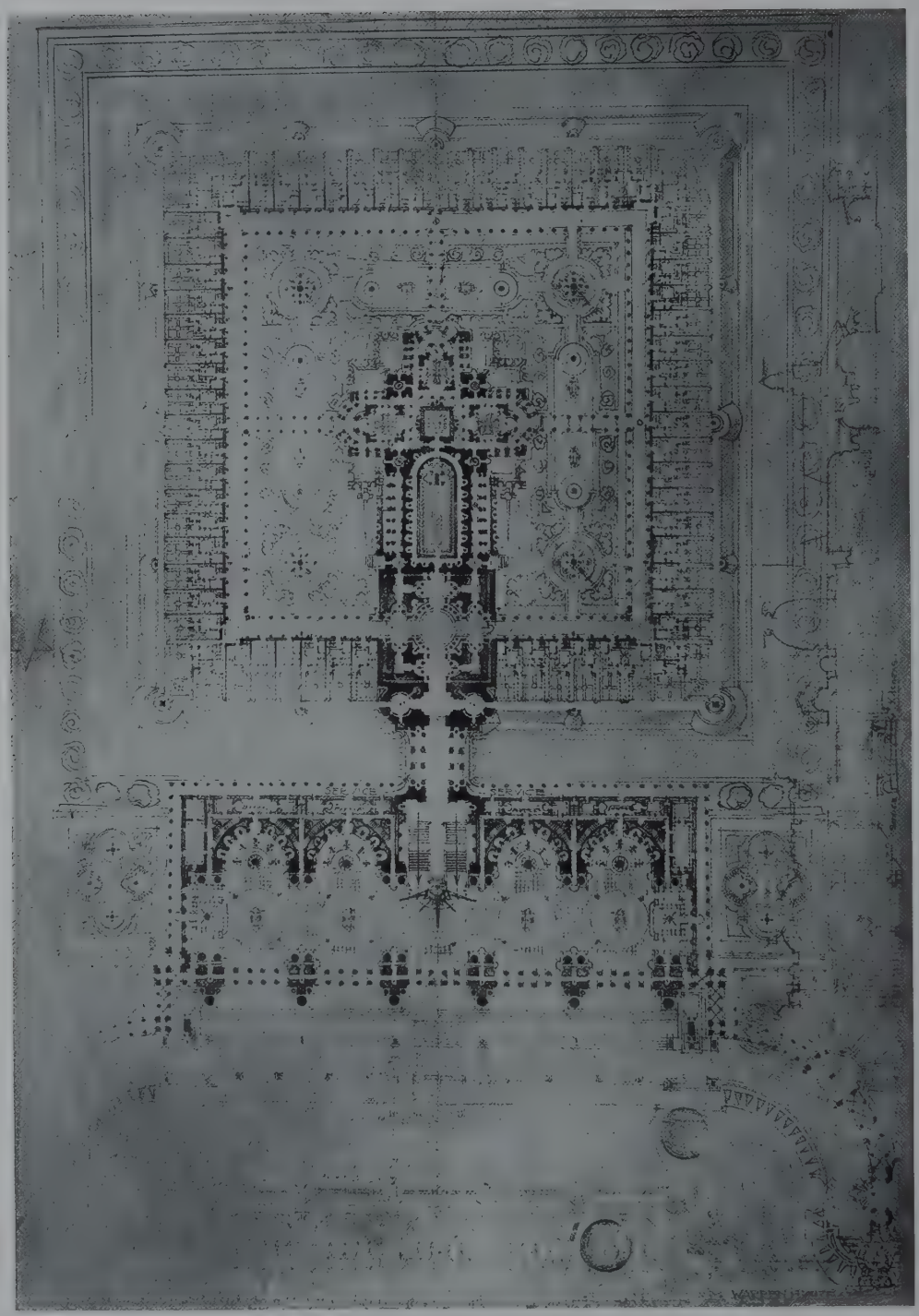

Figure 331. "A Conclave Building for the Election of a Sovereign Pontiff", by Burnham Hoyt. First Prize, Warren Prize Competition, 1911.

THE SKETCH PROBLEM AND PRIZE PROBLEMS

Chapter XXXIV

THE PLAN SKETCH PROBLEM

IF WE consider now the plan sketch problem we find it similar in some ways to the decorative sketch problem, and very different in other ways.

The parti becomes most important now: the parti *must* be a solution of the problem, satisfying all its conditions; and this satisfaction is now quite largely a question of logic, of reasoning, and no longer a question of individual taste, as was the case very frequently in the decorative sketch problem. The importance of a good parti cannot be too much stressed; the man who has the ability to find a good parti can be a successful architect, even if he cannot draw—he can hire men to do his drawing. It is not so easy to hire men to find a parti.

The preliminary work in an esquisse-esquisse is to understand the program and find a solution for it. Become thoroughly familiar with the program; read it several times, paying attention to every word, for each word is put in for some particular purpose. Then separate what is important from the minor requirements—try to find the spirit of the problem: a military barracks, for instance, must have a different character from a seashore hotel.

One looking at a sketch problem, without having read the program, should be able to tell what general type of building it is. This means, of course, that to do a good sketch problem you must know the general character of different types of buildings. An industrial building, for instance, will have a rectangular outline, with businesslike poché—no elaborate gardening about it. (Figures 336 and 337). If the student has made the study, previously suggested, of just this question of types of parti for different kinds of buildings, as expressed in the academic tradition, using for this purpose the Grand Prix plans, or those in the Concours d'Architecture, previously mentioned (of which one is published for each school year), by making a sketch note of the plan after reading the program and putting down its main requirements, he will be well prepared for this part of his work on the esquisse-esquisse.

Having studied the program carefully, you must then determine into what divisions the various required spaces will fall, and this means more than just a casual setting down of requirements. In a "technical school"—such as Figures 326 and 327—there will be required several classrooms, but some of these classrooms will be just like the classrooms where any other teaching is done—language, mathematics, or history, for instance—while others will be classrooms for technical teaching, and will be quite different. In a sketch problem, such differences as these are emphasized.

In a sketch problem it is necessary to force the requirements a little to make them more apparent. It is just as in a poster, one exaggerates the drawing to make it "carry", to force an idea. One should be able to read an esquisse from a distance: it should be clear, and show the details of the program without requiring one to take the program and check the list of requirements to see if all have been met.

Another important item in finding a parti is to take account of location. Whenever a program mentions the character of the site (on a hillside, on flat ground, on the shore of a lake), that is a hint to especially emphasize this requirement. Make it absolutely clear—to some extent exaggerate it.

And, as it is necessary to think clearly to find a parti, eliminate the unessential: do not worry, in an esquisse-esquisse, whether or not "the office of the manager is next to the general office": you cannot go into detail.

It is important to get the proper scale at the beginning; mark in the corner of your paper—the backing paper over which you make your first studies—a drawn scale, 10, 20, 50 feet, so that you will always have an idea of size before you. Once you have this in mind you do not need again to use a scale until you go to final scale, when the process is repeated.

If your drawing is "out of scale" at all, it is better that it be a little below scale than otherwise. We spoke in Chapters XIV, XV and XVI of the number of architectural motives that would properly go into a given length of building. In an esquisse-esquisse it is better, considered from this standpoint of scale, to have a *greater* number of motives in a building—as compared to the proper number—than to have *fewer* than the proper number. This will make the building look larger than it is.

We have already spoken of the division of time in a sketch problem—how long to spend on the study of the program, on study at small scale, when is the proper time to go to large scale. Each man has a different way of working—and each man works at a different speed. After you have done several sketch problems you will know how long it takes to make the final drawings, and you must leave enough time for this purpose. It is largely a personal question, and no fixed rules can be given; *the presentation, however,—the drawing at final scale—will take by far the largest part of the time, two-thirds or more.*

After studying the program start by making

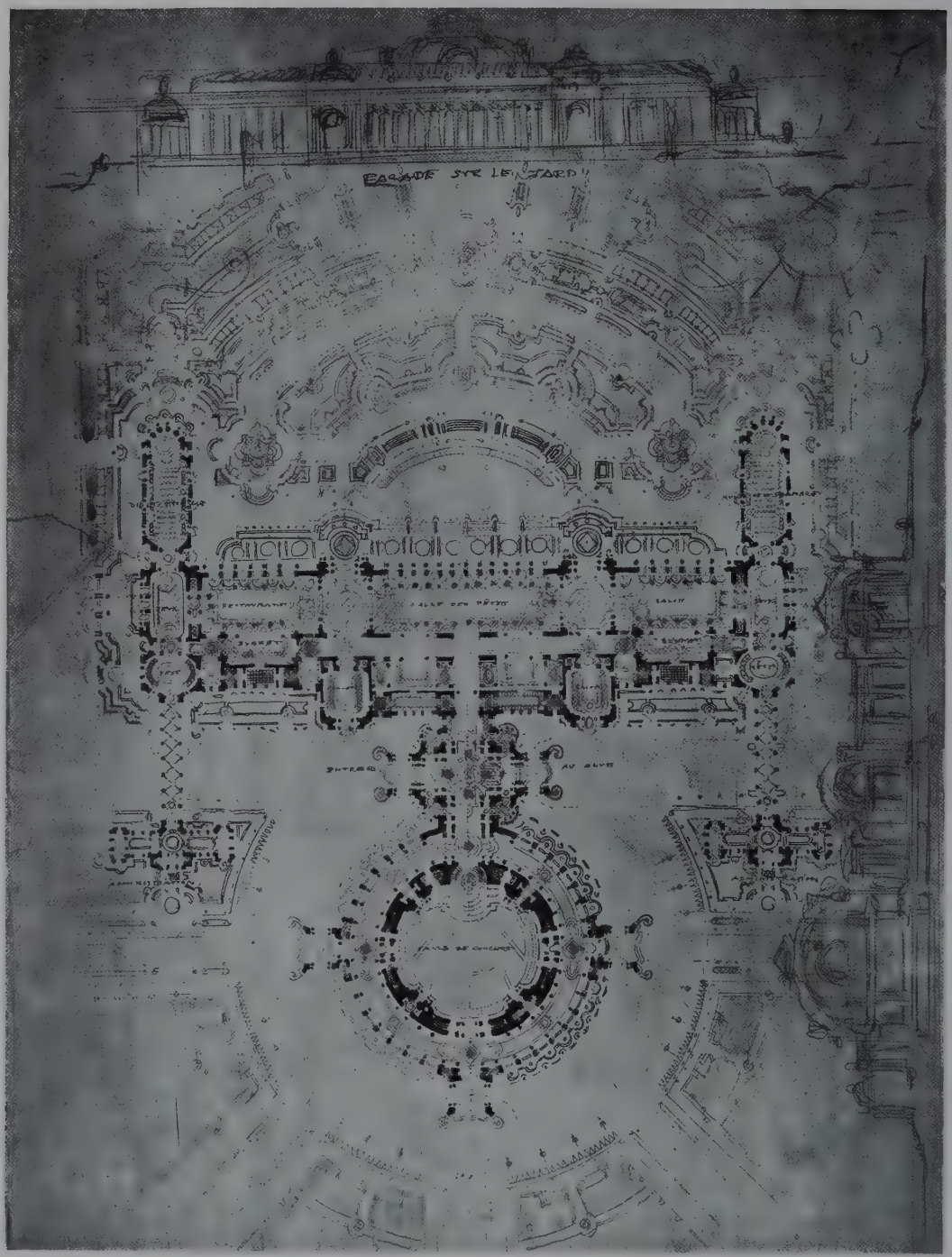

Figure 332. Plan of Design for a Concert Hall, by D. M. Kirkpatrick, Concours Labarre, Ecole des Beaux Arts.

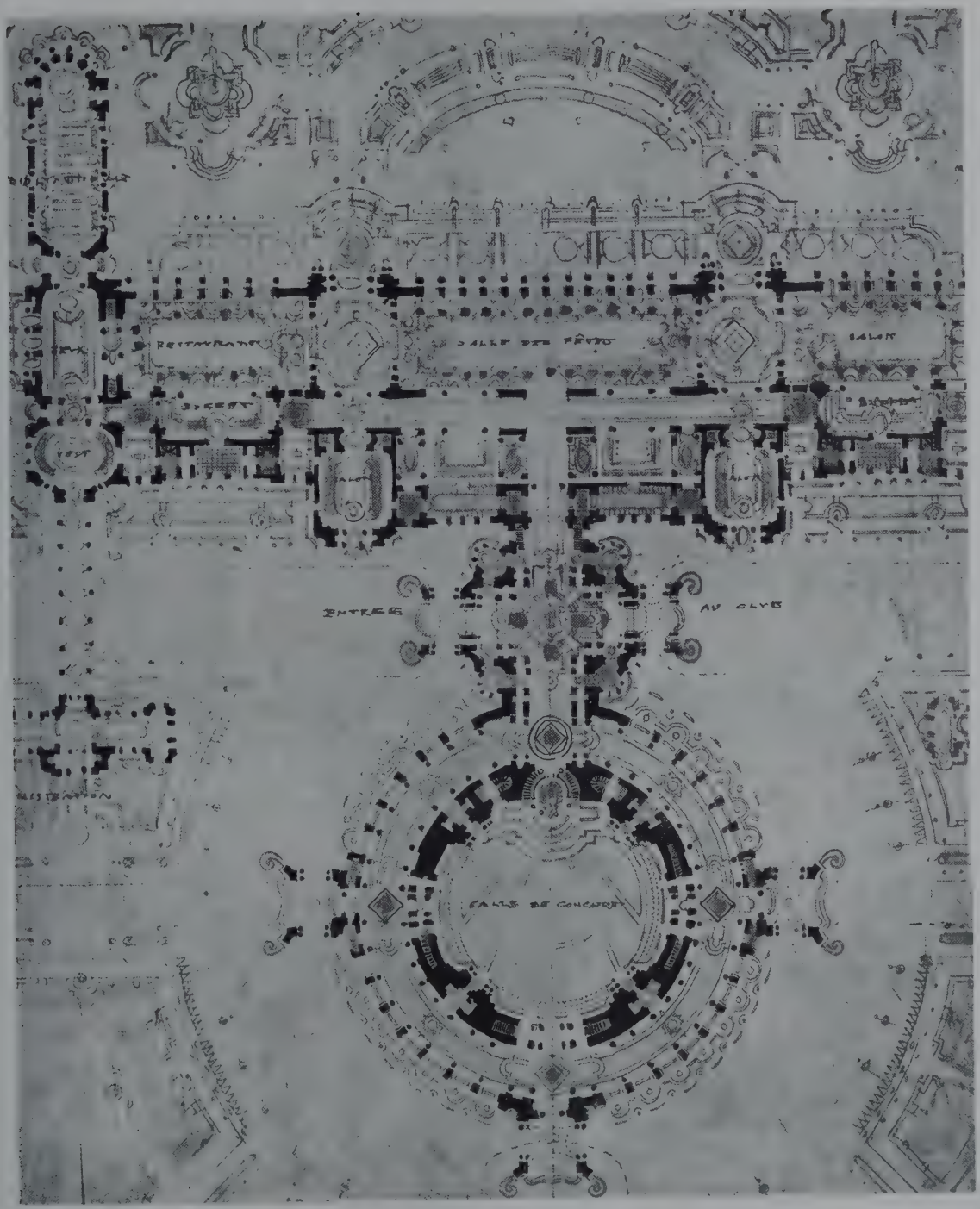

Figure 333. Detail of Design for a Concert Hall, by D. M. Kirkpatrick, Concours Labarre, Ecole des Beaux Arts.

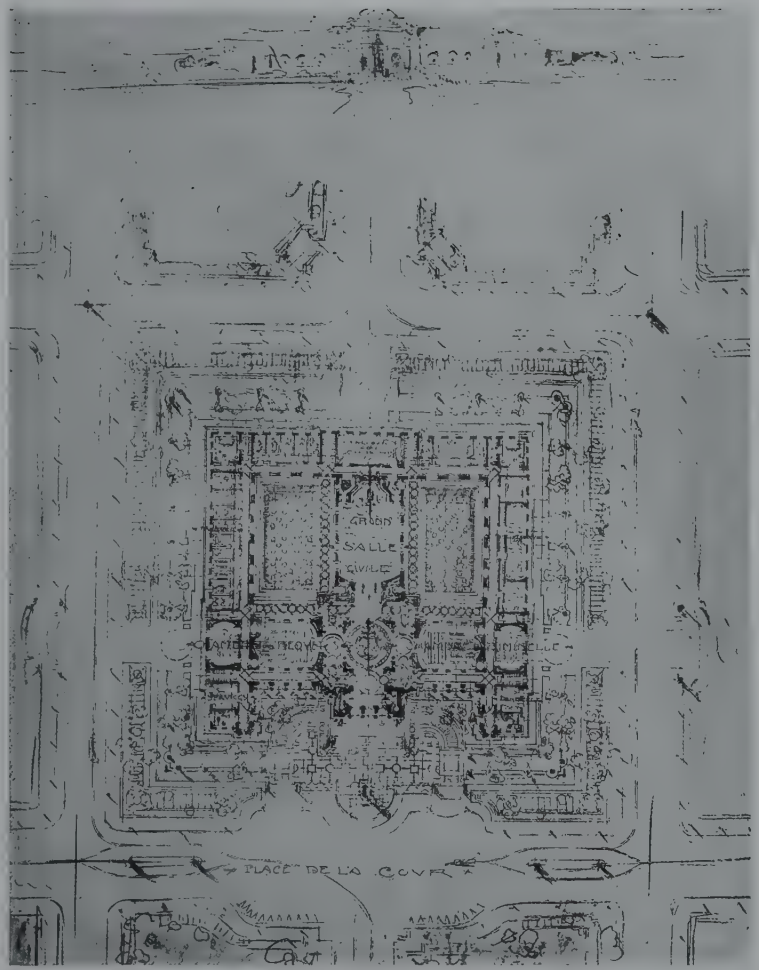

Figure 334. Design by M. Durand, Pupil of M. Deglane, for "Palais pour La Cour de Cassation." Twenty-four Hour Sketch, Ecole des Beaux Arts.

Figure 335. Design by M. André, Pupil of M. Héraud, for "Une Residence pour un Chef d'Etat." Concours Labarre, Ecole des Beaux Arts.

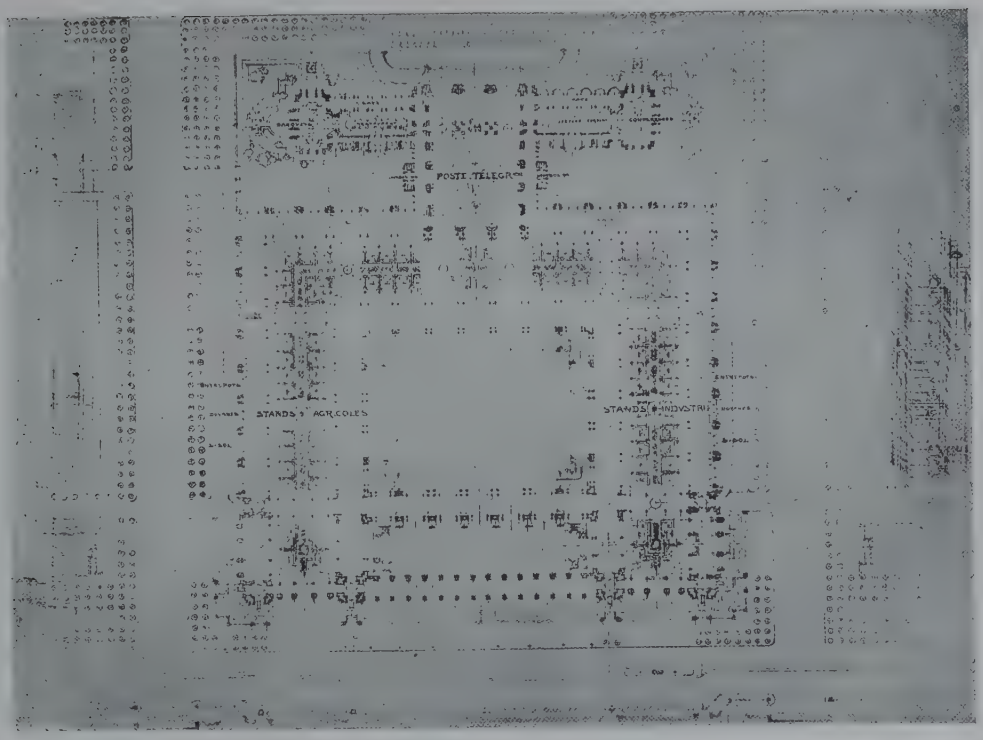

Figure 336. Design by M. Bray, Pupil of M. Pascal, for "Une Bourse du Commerce et de l'Industrie." Twenty-four Hour Sketch Problem, Ecole des Beaux Arts.

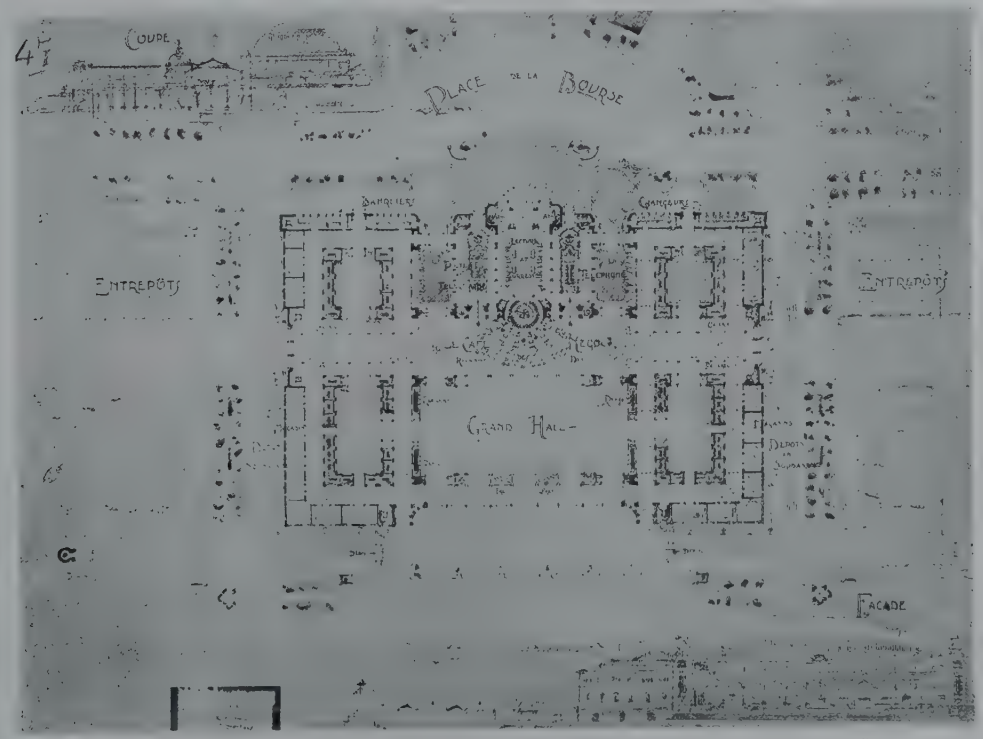

Figure 337. Design by M. Delaitre, Pupil of M. Deglane, for "Une Bourse du Commerce et de l'Industrie." Twenty-four Hour Sketch Problem, Ecole des Beaux Arts.

sketches at a small scale to find the solution—a parti that will "work". Do not be satisfied if it does not, for no amount of presentation will disguise this fact.

Then go at once to the final scale. Put down the size of the lot, the areas of any rooms given, and again a visual scale.

Now with charcoal block in your scheme, get the big picture—the big masses.

One thing which is important (and it is important for every composition in fact) is that your drawing should have a dominant part. *Avoid* having *several* "important" parts, all about the same size. In any decorative composition where all of the motives are of the same size there is no interest in any of them. In an Italian building, it is the big blank wall which sets off the few spots of interest, the carved panel or cartouche. (Figure 338). If you *cover* a wall with the most interesting ornament it is no longer interesting, Figure 339. In this example compare the façade of the villa, with its all-over ornament, with the garden wall in the foreground with its plain surface and spots.

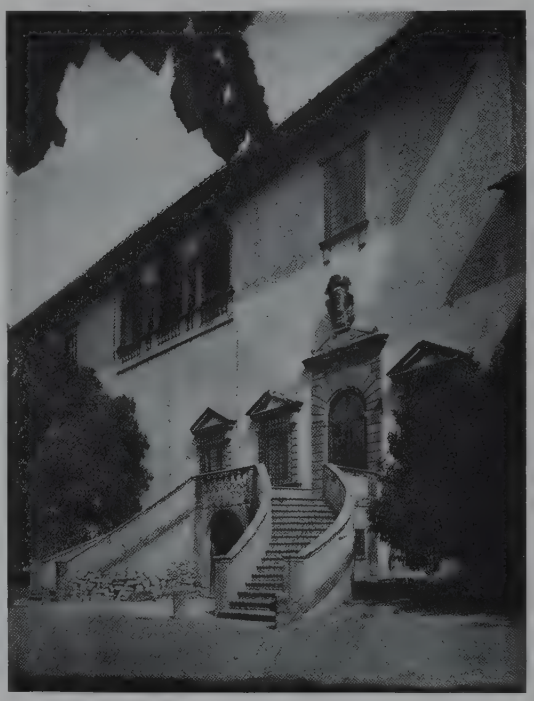

Figure 338. Villa dei Collazzi, South Side.

One feature must be made the prominent part of the composition—the key to the whole thing. This one feature (in a plan problem) is not necessarily the building. It may be a "white", a garden, for instance, or a "Public Square" (as in the Grand Prix design of Jaussely, (Figure 138), and yet be the center key of the composition.

In other cases a building is in the center and, if it is a large building, some portion of it is chosen and featured, as the "focus" of the composition, as in Figure 331. This is a Warren Prize drawing and one of the best in the history of that competition. In this competition documents and criticisms may be used, and it is interesting to recognize in this plan the recall of various documents which have inspired it. The individual habitations for the prelates, surrounding the big cloistered court, are just such as those at the church of S. M. Degli Angeli, shown in Figure 159: the large loggia at the front has something of the character of the loggia of the Villa Madama. A knowledge of a number of examples of different architectural forms—a working vocabulary—is, of course, of the greatest value in doing sketch problems. This Warren Prize drawing is a good example of a well presented sketch problem.

If the program requires several buildings, it will be necessary to compose "entourage" around them. In an esquisse-esquisse this should not be done in a separate operation—it should be all done at the same time, for both it and the buildings are parts of what *is a single decorative composition* as well as a plan problem. A plan must be composed with the open spaces just as much as with the buildings.

In some problems the site is so cramped that the building required just fits it, as in Figures 336 and 337. Any program calling for a building or group of buildings on a site within the city is apt to be of this character, unless very large in size. In others the site is more ample, as in Figures 142 and 174, or in Figure 335. In such cases as the latter it is well to start the big scheme in composition by laying out the two big axes, at right angles to each other, and arrange the buildings on or about them afterward—working first the roads, the circulations, the gardens, etc.

This is not unreasonable. If you have a large group of buildings, the buildings are not important in themselves, so far as the composition is concerned: it is the grouping which makes the composition — the planning of the open spaces, not the buildings. So, in large compositions, do not start by taking the requirements and working up each building—you will find it more satisfactory to design the courtyard, or the plaza, and place the buildings around it, especially for the esquisse-esquisse.

There are problems where the site given has special topographical conditions—sloping ground, or ground open toward a sea. Here again it is much more important to compose with the open spaces than with the buildings. Work it all at the same time. On sloping sites the buildings should be so arranged that their long dimensions will be parallel to the contour lines, rather than at right angles to them.

If the program calls for one building and this building, from the requirements given, about fills the size of paper or card allowed, the design of the entourage is not important. For this reason it is well, after reading the program, if it calls for a single building, and says the lot is, say 300 by 400 feet, and at such and such a scale, to find out how much of the paper is occupied by this building, and

you see right away how much is left for a plaza in front, etc. If there is plenty of room, study its composition with that inside the lot; if there is only a little do not spend much time on it, for a few lines will be all that is necessary; then think of the building only. The elevation and section in these plan sketch problems do not take much room or require much time.

In making the final drawing do not be afraid of putting in too many lines—some of them can easily be lost in the rendering, if that should be desirable; while too few lines always give a plan an empty look. As an interesting example of the technique of presentation we show Figure 332, a problem entered in the Labarre competition at the Ecole des Beaux Arts by D. M. Kirkpatrick (Paris Prize 1912) and a detail portion of it at larger scale, Figure 333.

Figure 339. Villa Palmieri, Garden Front.

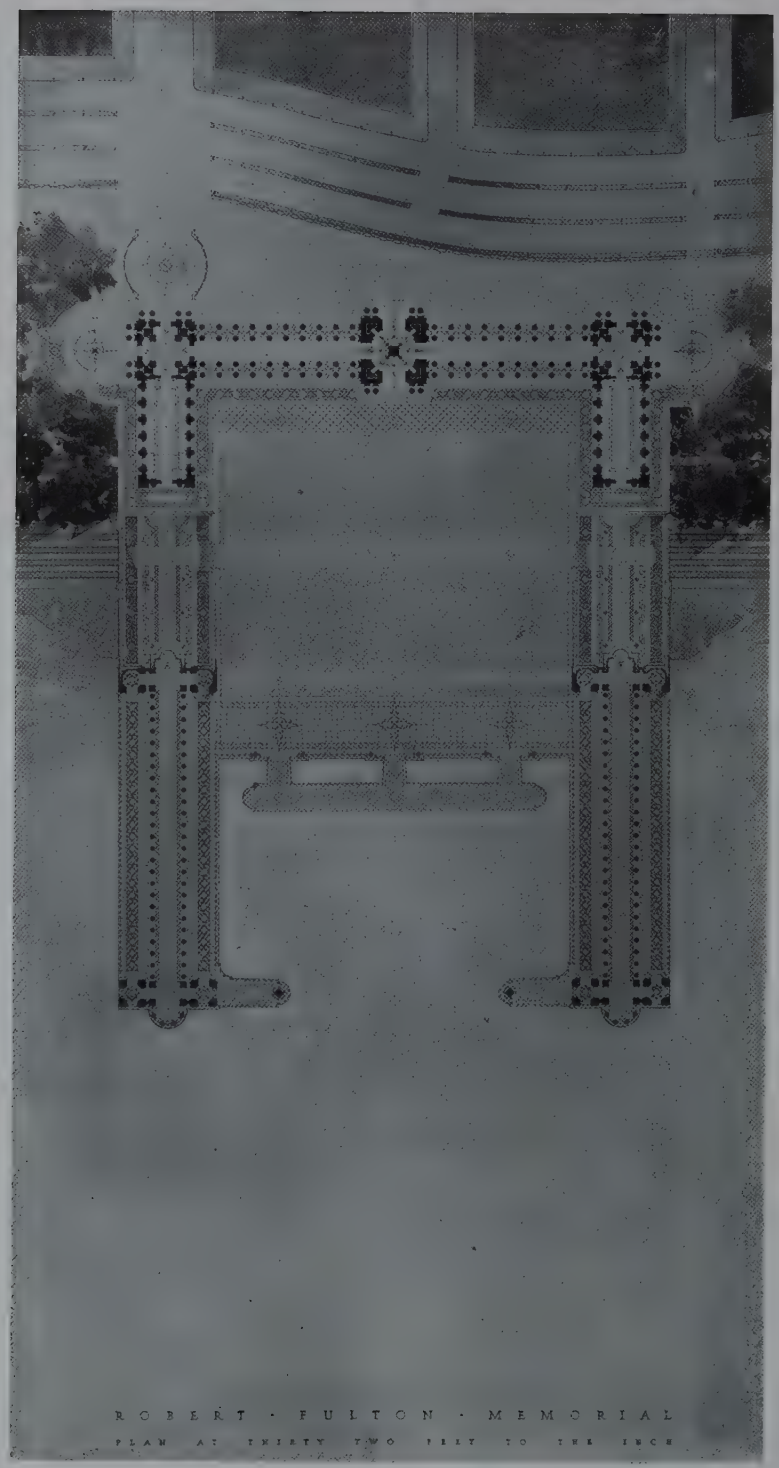

Figure 340. Plan of Winning Design by H. Van Buren Magonigle, Competition for Robert Fulton Memorial, New York.

THE SKETCH PROBLEM AND PRIZE PROBLEMS

Chapter XXXV

THE SECOND PRELIMINARY COMPETITION FOR THE PARIS PRIZE

THE final competition for the Paris Prize is the most important educational competition of this country; the test by which one may measure his attainment in academic training, his knowledge of the theory of design, and skill in the presentation of this knowledge.

It is seldom in actual practice that problems arise that can equal in magnitude or difficulty such problems as are given for the Paris Prize. (See Figures 171, 254, 255, 364, 365, 366, 367, 373, and 374). Once in a while such a program as that for the Robert Fulton Memorial in New York (Figures 340 and 341) or the recent competition for a War Memorial in Kansas City (Figures 342 and 343), or Mr. Cass Gilbert's plan for an Art Museum for St. Louis (Figure 345) permit opportunities for an equal breadth of vision, fertility of imagination and ingenuity in arrangement. In the large competitions vast sums of money are spent to present the schemes as well as it is possible to present them; but they are judged on a parti: it is the *parti* that *is all important.*

To enter the Paris Prize competition one must first pass the "Second Preliminary," and this preliminary is itself a competition on a big scale—it is the biggest academic *sketch* problem given in this country; and here too the *parti is all important.* This cannot be too strongly emphasized. Many times the best presented drawings have the most satisfactory parti. But this is not always the case. Of the successful drawings in the second preliminary competition for the 16th Paris Prize—"A Summer Hotel"—cleverness in presentation is more evident in those placed at the end of the group, Figures 346 and 347, than those first chosen for admission. The drawing placed first in the preliminary competition for the 12th Paris Prize was also very simply presented, Figure 348, while that placed fourth, Figure 349, is much more elaborate and finished as presentation. It was a question of soundness of parti. Success in this competition depends first of all on one's ability to find a scheme for a program. It is for this reason that I suggested in Chapter XXXIII that you "go into training" for this competition, taking a number of such problems, say one every two weeks. This is an excellent training in parti. For the same reason it is well for the Class A man to work out a parti for every program—Class A or Class B—that is given out in the atelier whether it is one that you may send as an esquisse and may work up as a regular problem or not—simply as an exercise in the finding of a parti. Looking at the published work after the judgment will have an added interest to you if you have done so and be a greater stimulant in your development.

A man's ability to find a parti depends on the length and intensity of his training, on his experience, just as much as does his ability at presentation—his knowledge of technique; the better one is prepared, the more experience he has had, the

Figure 341. Winning Design by H. Van Buren Magonigle, Competition for Robert Fulton Memorial, New York. Rendering by Birch Burdette Long.

Figure 342. Design by Paul P. Cret and Zantzinger, Borie and Medary, Competition for Kansas City War Memorial.

better will he be able to acquit himself in this competition.

It is interesting to study the five drawings placed in the 13th competition, shown in Figures 350, 351, 352, 353, 354, after reading the program:

Program.

Second Preliminary Competition for the 13th Paris Prize of the Society of Beaux-Arts Architects. Program: The Annual Committee on the Paris Prize proposes as subject of this competition "A Sailors' Y. M. C. A. at Manila." Introduction: The entertainment of soldiers and sailors while on leave has been, during and since the war, the subject of a great deal of study and consideration by various societies and organizations. The Y. M. C. A., in continuing this work, wishes to establish at Manila a recreation center for the sailors from the visiting warships and the naval bases located there.

The climate is sub-tropical. It is desirable, therefore, that the plan be conceived in such fashion as to provide adequate shelter from the sun, and to allow the free passage to the breeze, securing in this manner, the greatest protection and comfort to those who are pursuing the various activities provided for them.

The Problem: The ground to be occupied by this recreation center is on the harbor, easily accessible to the ships at anchor by means of launches and other small boats, and to the naval base by a boulevard which runs parallel to the shore front. It is rectangular in shape, and its greatest dimension must not exceed 600 feet.

Provision is to be made for the following departments:

1. Athletics: Vestibule with stairways; physical director's room and examination rooms; the gymnasium of not over 8,000 sq. ft. area, with running track and spectators' gallery; a swimming pool not over 4,000 sq. ft. in area, with showers, baths, drying rooms, lockers, toilets and a barber shop; squash and hand ball courts. There should be provided out-of-door space for tennis, basketball and other minor sports. Baseball and football fields will be outside the grounds.

2. Education and Administration: An auditorium for lectures, concerts and moving pictures to seat 500 persons. A library. Four or five classrooms. A laboratory for general scientific education. The offices for general administration including central office and several secretaries' offices.

3. Social and Residence:

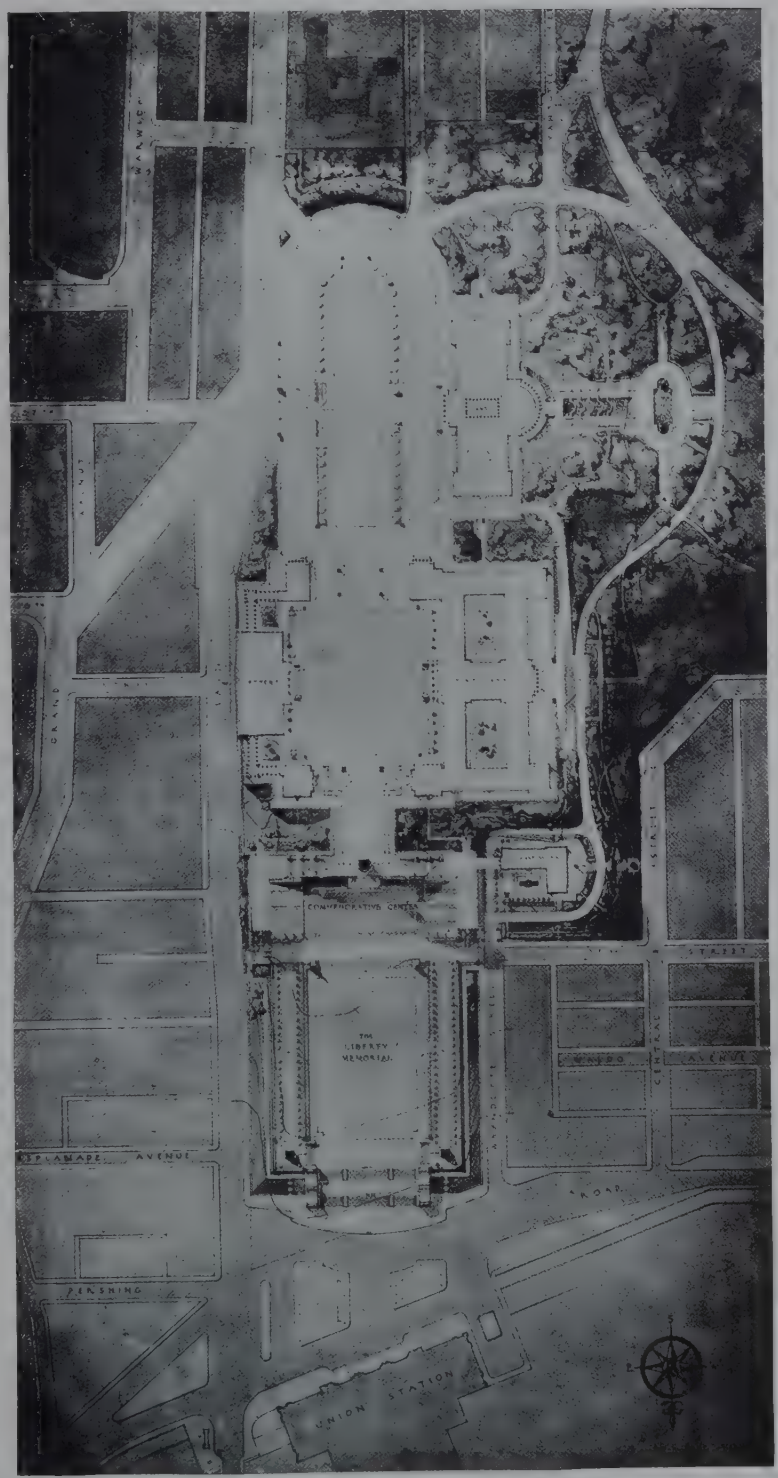

Figure 343. Plan of Design by Paul P. Cret and Zantzinger, Borie and Medary, Competition for Kansas City War Memorial.

Figure 344. Bird's Eye View of Reclamation and Restoration of World's Fair Grounds and Museum of Fine Arts, St. Louis. Cass Gilbert, Architect.

Entrance lobby. Social hall. Billiard room (8 or 10 tables). Several small club rooms and card rooms. Outdoor rest rooms or porches overlooking the bay. Cafeteria for about 300, with serving pantry. (The kitchen and store rooms may be in the basement.) Dormitories for 200 men on the floor above.

In a big plan sketch problem this parti must be found quickly; presenting the scheme will require three-fourths of the time allotted. Once having chosen your scheme your problem is to get your solution "across" to a jury—in a given time.

You must study the problem (as distinct from the more mechanical presenting of the scheme you have studied) long enough to understand it. You should study with a pencil after the first two readings of the program. Make the early studies of a group plan simply, in block form, with a bit of charcoal. Work things freely in your mind and on paper before thinking at all of detail. Work out your scheme at small scale, grouped the way the whole thing is to look, in *the limits of the final sheet,* marked and laid out at this small scale. Block the buildings in; study the entourage and gardens. Now take tracing paper and pencil, and sketch in the poché and develop in pencil the idea and composition you have laid out in charcoal.

What it is necessary to "present," is your idea—the whole thing—but you do not need detail; such detail as you do put into your drawing must look like something. The individual lines may not mean anything; but they must, together, convey a meaning; the drawing should be made to look at first glance like a finished problem. The simple, mechanical difficulties of presentation are large; there is a lot of work to put on paper in a short time. You cannot take the time to study your scheme at several different scales.

You have put your scheme at small scale on paper, indicating as well as possible the way the whole thing is to look, with the entourage, etc.—the complete effect. Put this at an upper corner of your board, and jump right up to final scale, and go at it with the charcoal again. Put a drawn scale somewhere on your paper; you must take every method you can to eliminate useless work to save valuable time; a visual scale can be referred to constantly by eye to gauge sizes.

Draw the axis lines first, then block in the masses in charcoal, enlarging everything from your small scale drawing up in the corner. In going up to the final scale do not lose the proportions that were studied at small scale. Then you have the solution at scale, and "composed" (if it was composed on the small sketch, which of course should be the case). After this it is simply a matter of drawing and indication. A man who has trained as I have outlined by taking several similar problems in succession, will now know how long it will take him to get his idea

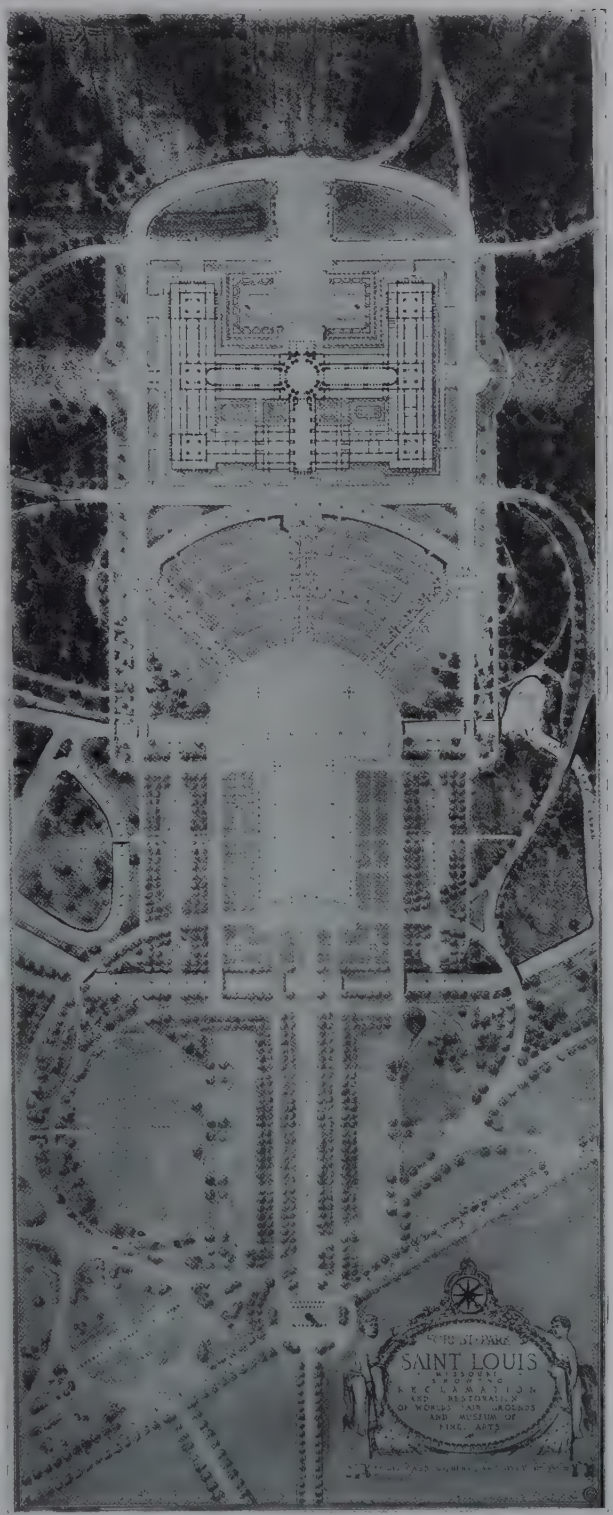

Figure 345. Plan of Reclamation and Restoration of World's Fair Grounds and Museum of Fine Arts, St. Louis. Cass Gilbert, Architect.

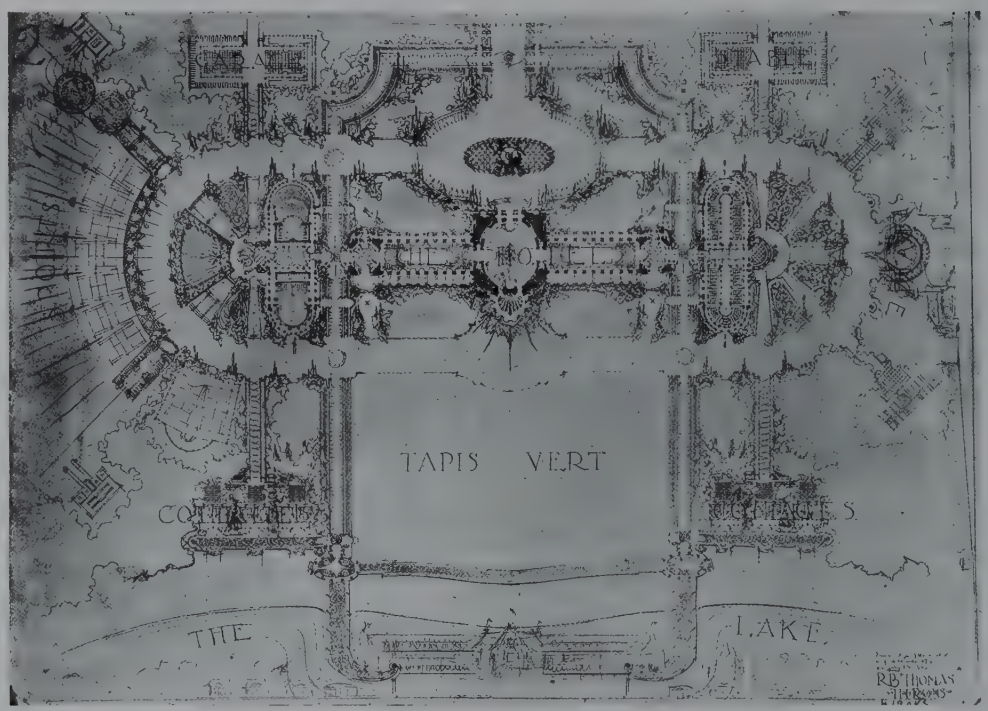

Figure 346. Design by R. B. Thomas for "A Summer Hotel." Beaux-Arts Institute of Design, Second Preliminary Competition for Sixteenth Paris Prize.

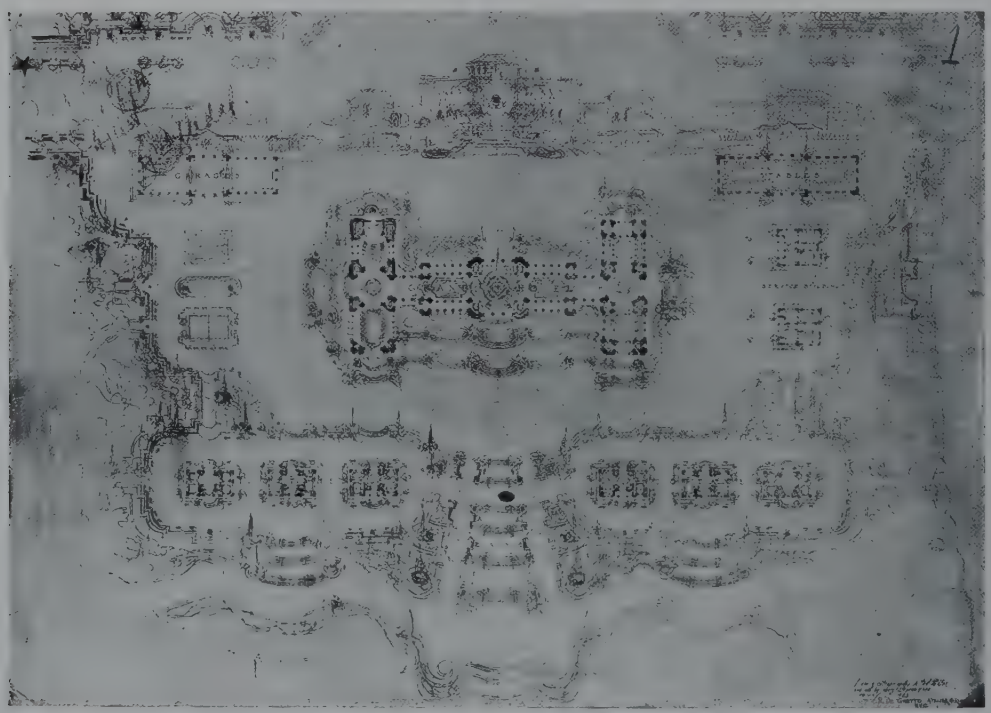

Figure 347. Design by R. DeGhetto for "A Summer Hotel." Beaux-Arts Institute of Design, Second Preliminary Competition for Sixteenth Paris Prize.

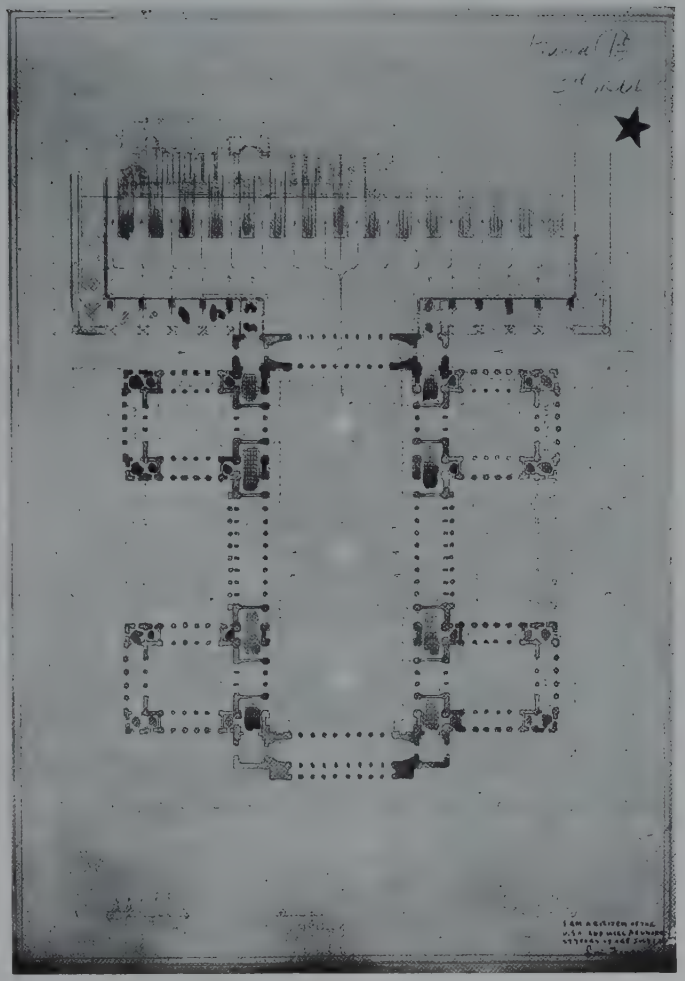

Figure 348. Design by L. Fentnor for "A Terminal Railroad Station," Beaux-Arts Institute of Design, Second Preliminary Competition for the Twelfth Paris Prize.

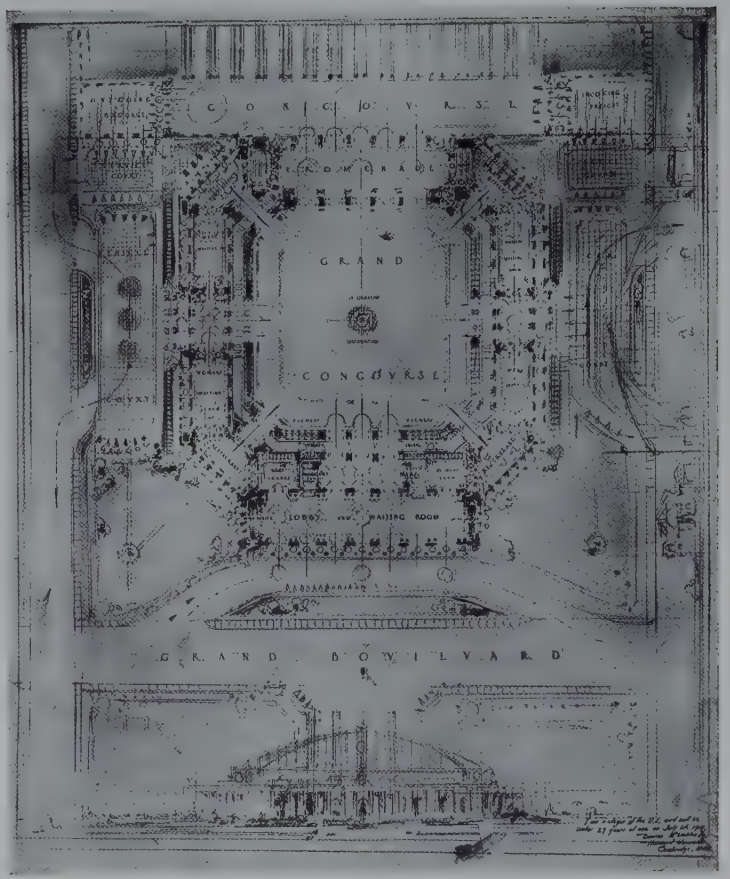

Figure 349. Design by D. McLachlan, Jr., for "A Terminal Railroad Station," Beaux-Arts Institute of Design, Second Preliminary Competition for the Twelfth Paris Prize.

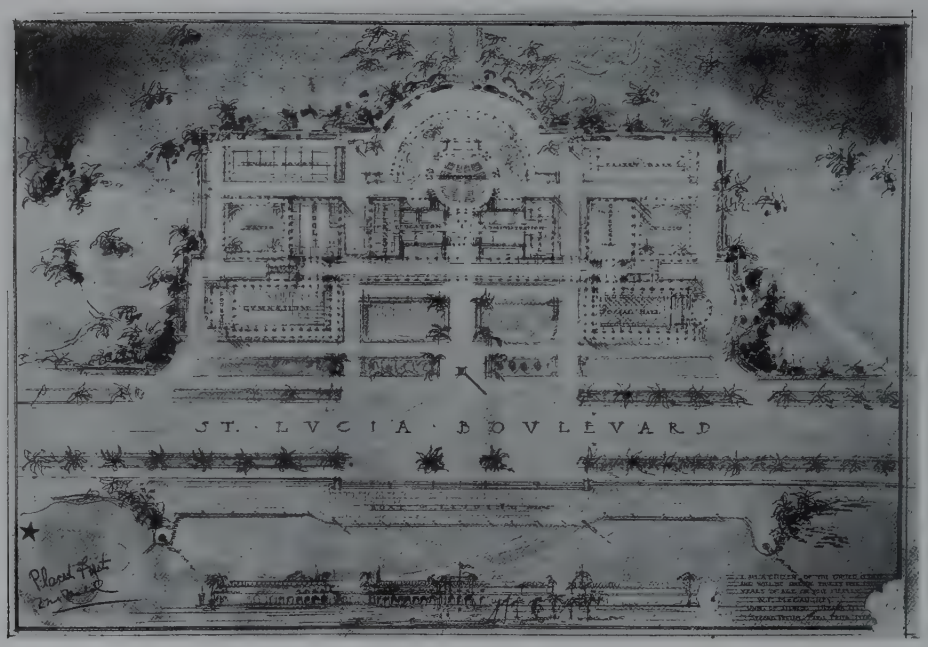

Figure 350. Design by W. F. McCaughey, Jr. Beaux-Arts Institute of Design, Second Preliminary Competition for the Thirteenth Paris Prize. Placed First.

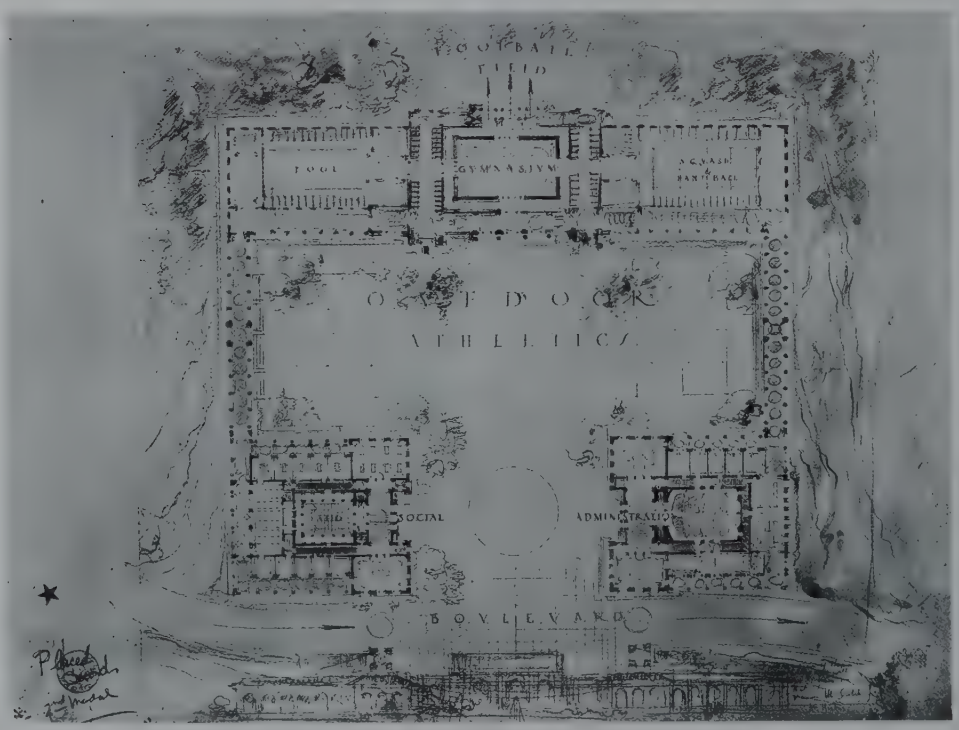

Figure 351. Design by D. McLachlan, Jr. Beaux-Arts Institute of Design, Second Preliminary Competition for the Thirteenth Paris Prize. Placed Second.

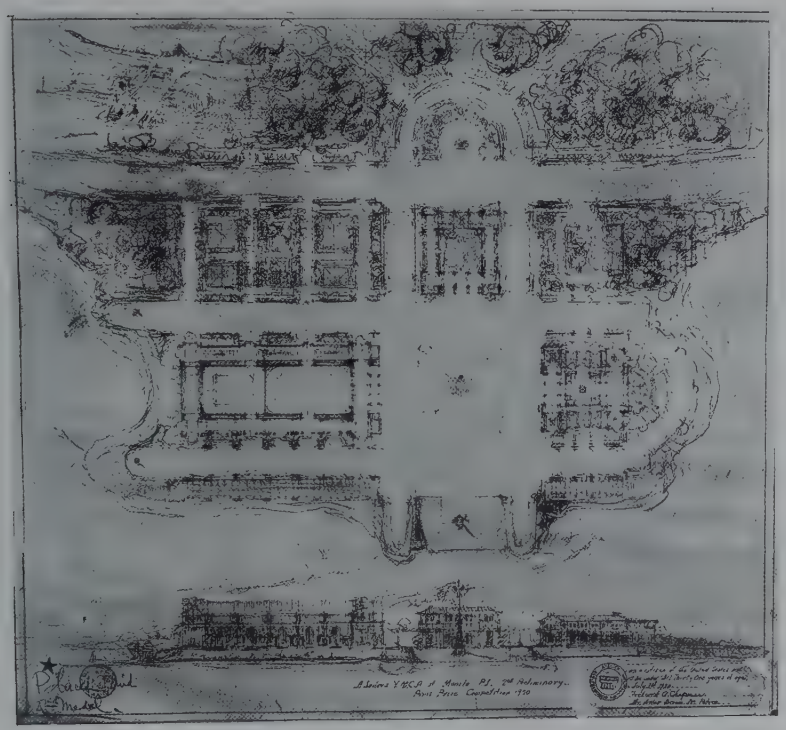

Figure 352. Design by F. A. Chapman. Beaux-Arts Institute of Design, Second Preliminary Competition for Thirteenth Paris Prize. Placed Third.

over on the final paper—whether he transfers with carbon paper or transfers by rubbing—and then rendered and presented in time, starting with this charcoal sketch of the big lines.

Now make studies in pencil on tracing paper over the charcoal study (there will be time for only one or two before the final); use the rubber freely, when something does not work out, make another try at that point. First sketch in the big poché, and the big circulations, inside and outside, freehand. Carry this study as far as you can, then make one more over this, a little more carefully, but still with a great use of freehand, and then you will be ready to transfer to the final cardboard. It is in these studies that you must try to express the "character" of the problem, and of each different portion. We have spoken of character in plan, in Chapter XIII. There are certain types of buildings to which academic traditions have given certain kinds of indication. There are certain types of site that in the same way have acquired a distinctive indication. They are all in "the books"—can all be studied. If you look at various "art gallery" problems of different sizes and kinds in academic work you will see a similarity in expression—a use in each of some of the same forms. It is the same with government buildings—with all the different "types" of buildings, in fact. In the few days before doing a sketch problem of this sort, look through the books and get as many of these things as possible in your head. There is no time to stop or correct now. You must use all your time and speed in getting your ideas down, and then in rendering to bring them out.

When you have made this second study in pencil, and carried it as far as possible, you are ready to transfer. This transferring is not—should not be—tracing; it is in reality another study, and you must do a certain amount of designing right on the final. The aim is to

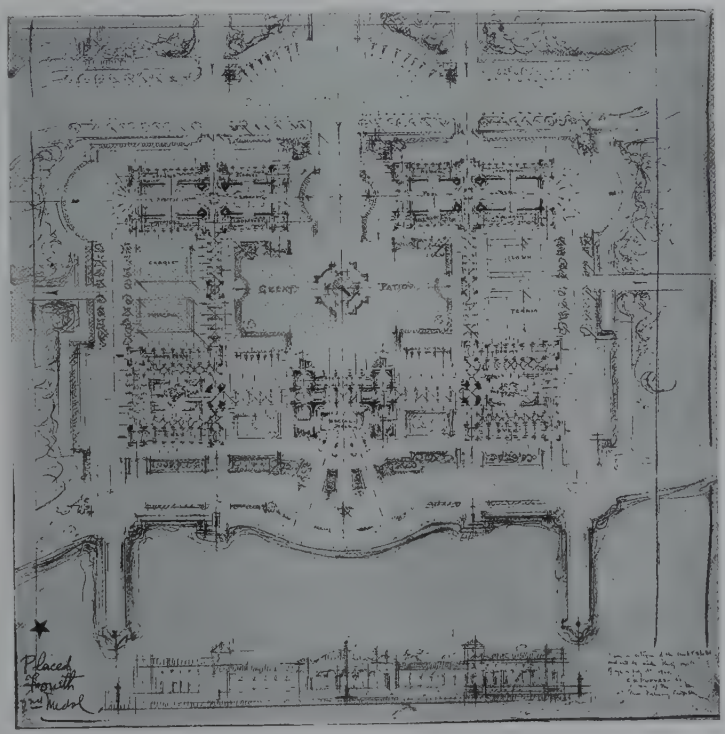

Figure 353. Drawn by E. R. Purves. Beaux-Arts Institute of Design, Second Preliminary Competition for the Thirteenth Paris Prize. Placed Fourth.

eliminate work and get ahead—to get your drawing of your solution completed in the time given. If it is only two-thirds completed—no matter how well this two-thirds is drawn, you have not given your idea a fair showing before the jury.

Do not be afraid of putting too many lines on the final—you can always lose some of them in rendering if necessary. The lines you want to count are the important ones, but they require many others to make them look well; too few lines leave a sketch problem looking empty — you can't put an idea across if your drawing is incomplete. At the same time, do not scratch in a whole lot of lines that look like nothing. When you do have to "pad", pad with lines that look like something.

After getting the big lines on your big study, it is best to work free-hand on most of the remainder — it is much easier and much quicker than working with T-square and triangle. As long as the main lines are straight, you can transfer the rest just as well free-hand, and with free-hand you will be much better able to get the "character" in your plan —both the general character and the character of the small spots.

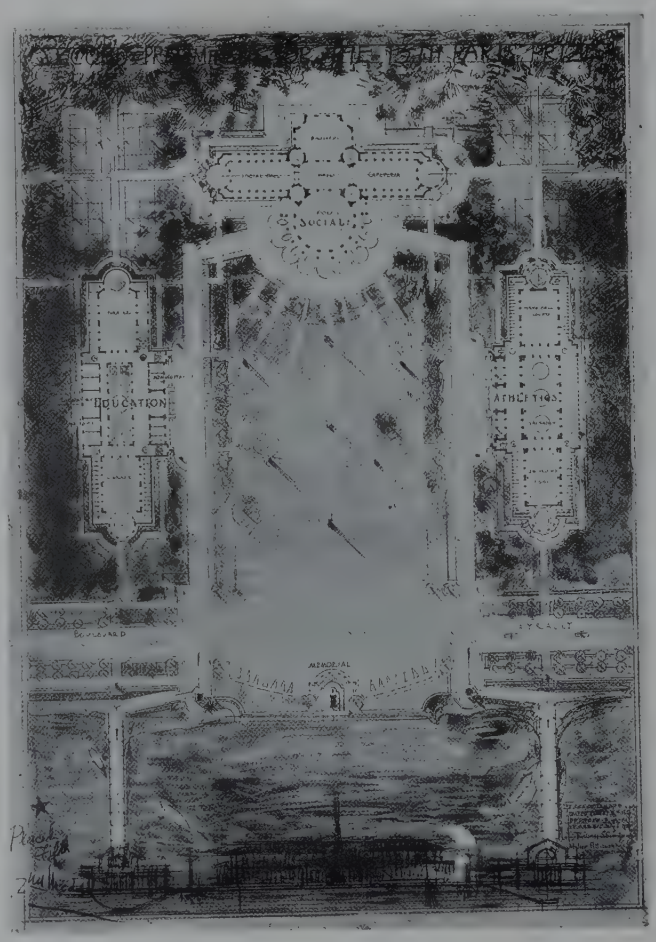

Figure 354. Design by Russell Simpson. Beaux-Arts Institute of Design, Second Preliminary Competition for the Thirteenth Paris Prize. Placed Fifth.

For you must get character in your plan* to get the idea across—there is a very different expression for a school (Figure 140), for instance, and a concert hall (Figures 332 and 333). Each type of building has a character of its own (we are speaking of plan now). It takes some training to be able to recognize this character, some experience to be able to give it to a plan. But the attempt must be made—you should know what kind of detail to use in the different kinds of buildings; having a command of such details of poché, of spots, corners, niches, etc., saves you much time. You can go twice as fast in drawing your idea, if you *know* how corridors turn, different ways to treat central spots, etc., because you won't have to stop your thought on the problem in general to work out these minor matters.

You can work up a vocabulary of such forms by going through two or three volumes of the "Concours d'Ecole" (des Beaux Arts), studying the published sketch problems with a notebook in hand, jotting down different ideas. Putting it in a notebook is primarily to fasten it the better in your mind, though it is of value also to have such a book to look through the night before the second preliminary program is given out.

It goes without saying, for the reasons above, that the poché should not all be of the same thickness — any more than in a projet; in fact in a sketch problem the differences in poché should be still more accentuated.

After you take up your transfer paper, your drawing looks like an inarticulate mass of lines—with your rendering you will bring out your idea —following for the general scheme your small scale sketch in the corner of your board. If you need a "white" rub out or rub down some of the lines. If your first washes show a "white" too large or small, make it wider, or narrower, by the next wash; but your rendering should be simple—just enough to express the idea. A lot of the actual drawing can be done for the first time on the final drawing (i.e., need not have been laid out on the study and transferred); do a lot with the free-hand pen on the final drawing. Try to get the whole thing down on the final sheet, and rendered, and still have time to get away from it and look at it, to see if there is something more needed to get it

* *See "Character in Plan", Chapter XIII.*

"across"; to make other men see your idea as you see it. And this is very much like cartooning; to get a likeness it isn't always necessary to put everything down, but what is put down should be what will be a "portrait" of your parti.

The question of "mosaic," of the filling in of a plan, is important. What shall we use as mosaic? The purpose of an esquisse-esquisse is to make *your* thought clear to some other people. The purpose of mosaic is to help make your idea clear. With poché alone, it would be difficult to explain the purpose of a certain room; mosaic shows without words the use of the room. It is *not an ornament,* but a means of explaining a scheme. It is closely allied to the theory of poché, of course; for instance, a stable and a greenhouse may be of the same size, but the greenhouse will have as poché just "points," with glass between, while the stable will have continuous walls with a few windows, and as "mosaic" some small divisions—the stalls.

In the same way a number of different rooms—which may all be rectangular in shape—may be identified by their mosaic. For a "salle des fêtes," or a ballroom, the typical expression is to show no "furniture" but to indicate the ceiling—usually an elaborate thing with vaults in penetrations, with highly decorated plaster work; this could never be mistaken for a library or a stable. A laboratory—which may be another rectangular room—will not be expressed by a ceiling, but by an indication of very large windows on one side, and perhaps none on the other: with very little on the floor and, say, two big tables. This will not look like a ballroom, or a stable. You show a building by rooms—try to show what is typical of the use of the rooms. There is a mosaic expression of each room.

But there is also the expression of the whole group, made of all the buildings *and* their rooms. Here too, the mosaic must explain—bring out some portions, make others inconspicuous; use the mosaic to emphasize what people do in the building. A railroad station, for instance, will have a large room in which large numbers of people are accommodated, and some offices, not open to the public. You can leave all the public portions white (or "white" as compared to the other portions) and the other parts filled up with lines. This alone will give an explanation of the plan—will show how the people enter and "circulate." In other cases it can be the reverse—rooms "white" and circulation "gray." It is not so much a question of what to do; there are many things that you can do; what is important is that what you do shall explain the parti.

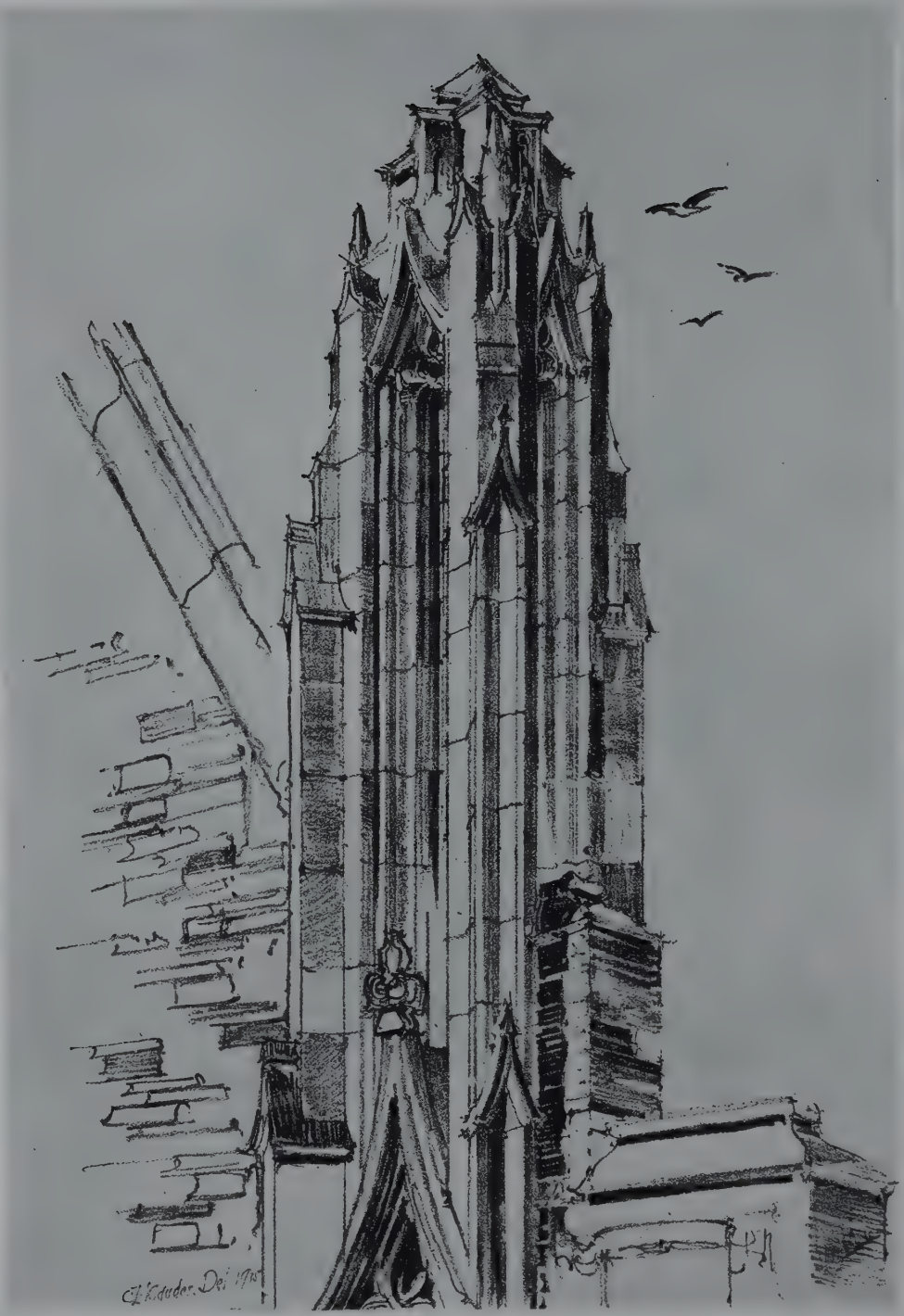

Figure 355. Study by Charles Z. Klauder for top of Buttress for Dining Halls, Princeton University, Day & Klauder, Architects.
See also Figure 356.

CONCLUSION

Chapter XXXVI

THE USE OF PERSPECTIVE IN ATELIER WORK

WE HAVE spoken several times, especially in the chapters on "The Archaeology Projet and Measured Drawings", of the value of perspective, and of its psychological effect on the jury. The principal use of perspective, of course, is to give a sense of the third dimension more effectually than can be done with a rendered geometrical drawing. It is always more effective in this way to a layman, and frequently even to one trained in the convention of 45 degree shadows and their relation to the projections which cause them. Indeed some architects use perspective very largely in their practice, not primarily for the client, but for themselves. Mr. Charles Z. Klauder is one of these, and Figures 355, 356 and 361 show some of his drawings made for studying a single detail of the dining halls at Princeton University. Studies of this sort were made for all portions of the buildings — and many of these perspective studies will never have been shown anywhere outside of the drafting room.

Many students, by the use of perspective, are made to realize that architecture of any kind does not have one "front" only; that it is not stage scenery. Many elevations studied just as elevations and without any intelligent working out with the plan and section, are impossible of building; things that do not show in elevation, however, do show in perspective, and by studying with perspective many errors are eliminated.

Of course this does not mean that perspectives always show up faults; far from it. A judicious choice of the point of view, or the clever placing of a group of trees, makes it possible to disguise defects that could not be so easily hidden in a geometrical elevation.

However, it is one thing to deceive an innocent spectator—even if he be trained in architecture—and quite another to deceive yourself: this is what should be avoided. Of course you want to make the best possible presentation of your design, whether that be good, bad or indifferent. To know its faults will help you in the presentation, as you will make an attempt to hide them from others. If you hide them from yourself, you are due for a hard fall.

Figure 356. Study by Charles Z. Klauder, Detail for Dining Halls at Princeton University.

Do not be afraid of deceiving the jury; it can take care of itself. But be prepared to take your medicine if you are found out; the jury asks no quarter—and gives none.

Before making any careful drawing in perspective, it is well to make a few free-hand, small-size sketches, to help in choosing an advantageous point of view —to decide whether to try to show as much as possible of two sides of a building, or by throwing one side in sharp perspective to emphasize the

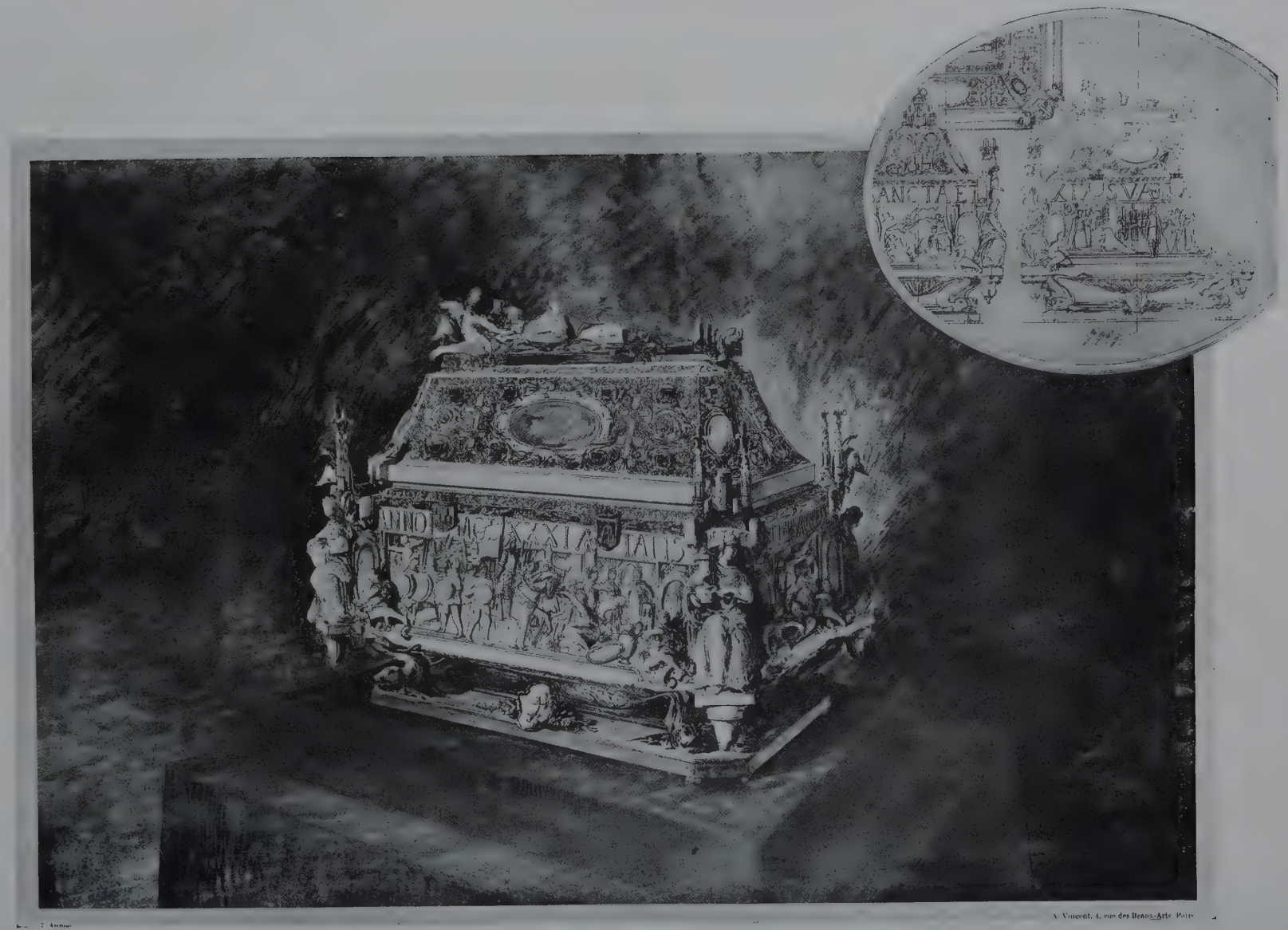

Figure 357. Design for a Coffer by M. Delaon, Pupil of M. Laloux. Second Prize and First Medal, Concours Rougevin.

other;* whether to keep the horizon low, so that most of the horizontal lines vanish downwards, or to have the horizon higher, so that half the horizontal lines vanish up and half down, etc.†

In choosing the point of view these two things especially should be borne in mind: (1) the point from which the finished drawing is to be seen, and (2) the limits of the "visual cone."

As an archæo, or the average Class A drawing, is usually put on a No. 1 mount it must be looked at from at least four feet away, preferably more. As a perspective is absolutely accurate from one point only, it is well to keep this distance in mind. Then, too, men have a habit of drawing a perspective from a plan and think that if they so place the point of view, or "station-point," that a 30 degree angle from it will enclose the plan of the building, all will be well. If, however, the building is high, this will not be the case, and, too, such an arrangement leaves no leeway for portions of surrounding architecture in the foreground. The visual cone, Figure 362a, which delimits the field of vision on the picture plane, should include everything you wish to show, if there is to be no distortion. Any portion of this field of vision may be used for the "picture" (Figure 362b). Having chosen the point of view, and arranged the composition somewhat by means of small and more or less free-hand studies, lay out the "bones" of the perspective— the framework— carefully, even mechanically, at the final scale. If you are to trace the drawing to rub on the final sheet, or if the final drawing will be on a piece of

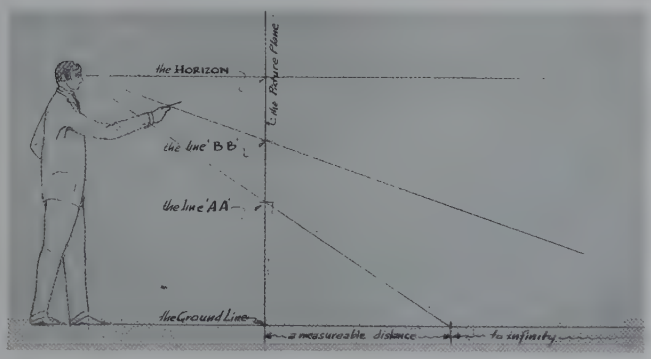

Figure 358.

**Note.—The latter is usually much more effective. A drawing at about 45 degrees—i. e., showing two sides about equally—is usually most uninteresting and even ugly. Try to look at one of your favorite buildings from such an angle and see how unpleasant it is.*

†Note.—Of these two the latter is, in most cases, very unpleasant. So many buildings are seen from the street, with the eye at, say, five feet above the ground, that what might be called a "second or third story view" is usually unsatisfactory.

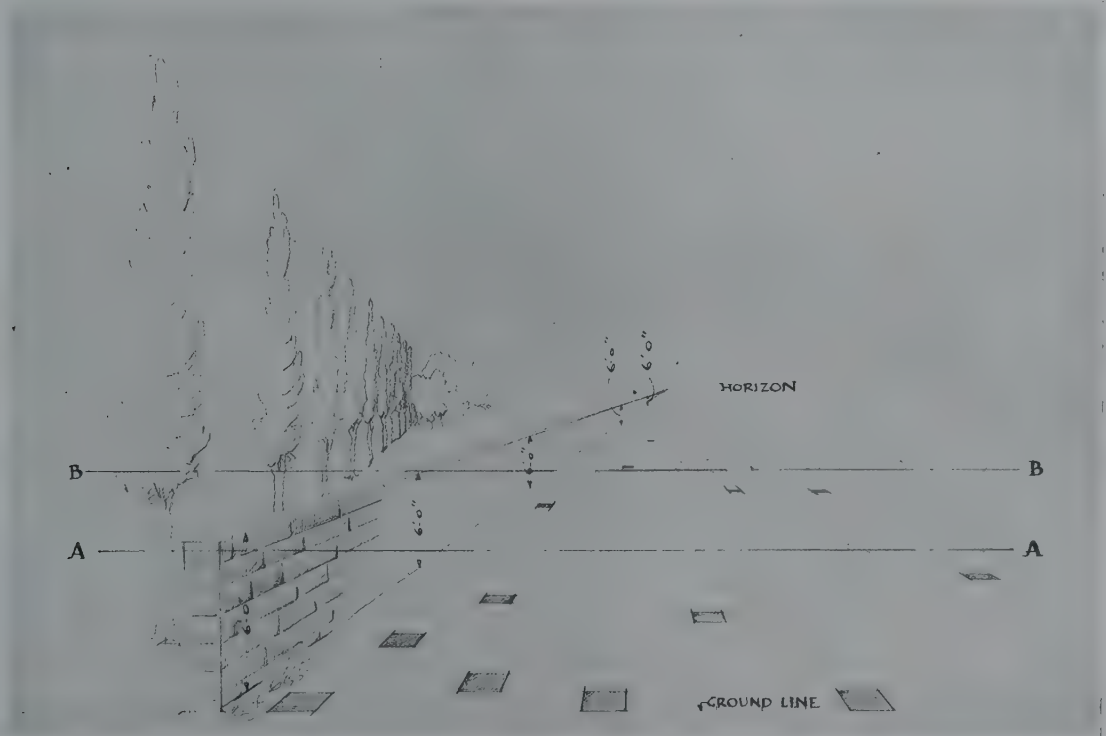

Figure 359. Vanishing Lines and Squares in Perspective.

Figure 360. "The End of a Salle des Fêtes," by M. Aragon, Pupil of M. Redon. Awarded 1st Second Medal in the Concours Rougevin for 1910-11.

tracing paper that may be mounted, this framework may be done boldly and with a soft pencil. If the work is to be drawn on the final sheet at once, the framing-in must be lightly done, so as not to spoil the surface of the paper with erasures, as these ruin an even wash. It will pay to do these framework lines carefully — the finish may be as rapid and "free-hand" as you wish. Any method of perspective may be used—perspective plan or apparent plan. The book of Ben J. Lubschez (D. Van Nostrand Co.) is valuable for the purpose as it gives just enough information to help in solving difficult questions, and the volume is small enough so that the necessary information may be found easily. Skill in perspective is largely a question of practice —intelligent practice—just as is the case in swimming or any other sport.

One's ability to lay out a perspective rapidly will be much advanced by the practice of sketching in perspective—such things as the returns of cornices, modillions from different angles, and column caps— the things that one wishes usually to put in rapidly and yet with a convincing sureness, rather than to have to work them out laboriously to make them appear right.

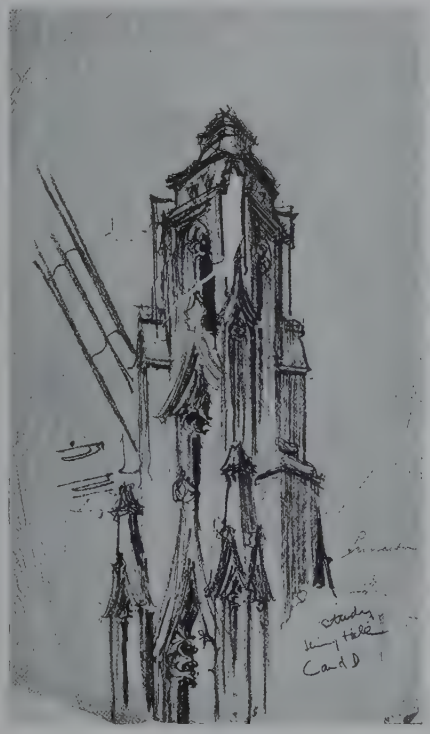

Figure 361.
Study by Charles Z. Klauder for Top of Buttress Shown in Figure 356.

To acquire this "perspective sense" one should develop particularly two things: (1) the ability to "vanish" lines, i.e.—to carry them *toward* a vanishing point without having to keep a straight edge against a pin at that point; and, (2), the ability to visualize and draw a "square" anywhere in perspective.

In Figure 359, for instance, the trees vanish, the lines in the wall vanish; and from the checkerboard on the foreground we see that what is in reality a square may take an infinite variety of diamond shapes in perspective, depending upon whether it is in the center, or at the extreme side, whether it is in the very foreground or approaches the horizon, and so forth. A few hours can be well spent in visualizing the appearance of a square in any position—in vertical and oblique planes as well as horizontal ones. Once you are able to visualize a square anywhere in perspective, it is a simple matter to compare any object to a square, or to several squares, or in the solid, to cubes.

Once you have the sense of "vanishing lines," it will be easy to carry measurements "into" a drawing.

If the wall of Figure 359 is six feet high, for instance, this six feet can be measured off anywhere along the wall—carried at any point of the wall from side to side, thus giving measurements anywhere within the picture by sliding the six feet around on planes parallel to the picture plane; and, of course, other dimensions may be laid off by proportion to the known figure.

It is well also to bear this in mind: suppose you have a foreground as in Figure 359; if you divide the distance from the bottom of the drawing to the horizon in half—as by the line "A-A," the portion of the ground below "A-A" represents *only a few feet*, while the portion above this line to the horizon, extending as it does to infinity, represents *a tremendous distance*. If we divide the space above "A-A" again in half, as by the line "B-B," we see that the portion nearest to us, between "A-A" and "B-B," is again only a short distance—a measurable distance—while the space between "B-B" and the horizon is again a tremendous distance. If we should divide this space again in two, we should have the same result. The lower half—the portion of ground nearest to us, is measurable—the part above — farther away from us—too vast to measure. If we now look at Figure 358, a diagram showing a side view of the spectator and of the drawing, we will understand why this is so. Above the horizon this would be reversed of course; and the same phenome-

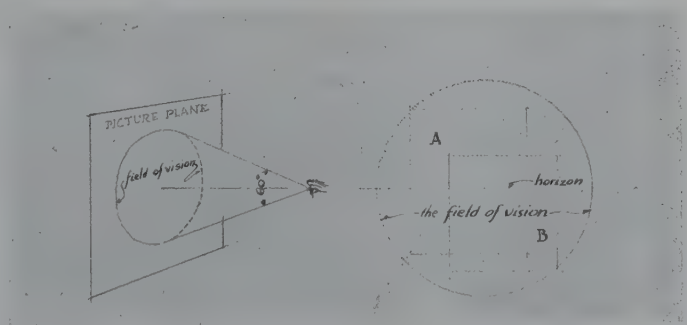

Figure 362a. Left, The Visual Cone. Figure 362b. Right, Different Possible Pictures in the Field of Vision.

non takes place on vertical or oblique planes.

Now a word as to vanishing points and vanishing lines. All lines that are parallel to each other and running away from us will appear to vanish in a point. If they are horizontal this point will be somewhere on the horizon—and we may conceive of the horizon as a series of different vanishing points; each one the place to which some set of parallel *horizontal* lines will appear to vanish. If we now think of these horizontal lines, as being parts of *horizontal planes*, we will realize that these planes, if continued away from us indefinitely, will appear to vanish in a line — a horizontal line—in fact in the "horizon," which may be called the "vanishing trace" of all horizontal planes.

In the same way all vertical planes that are parallel to each other will vanish in a line, which line will be the vanishing trace of these vertical planes. It will be a vertical line, and we may find the vanishing trace of such a set of vertical planes by drawing a vertical line through the point on the horizon which is the vanishing point of a horizontal line which lies in one of these vertical planes.

This vanishing trace will contain the vanishing points of all sets of parallel lines that lie in these vertical planes, just as the horizon contains the vanishing points of all lines lying in horizontal planes (thus in Figure 363, *p.q.* is such a trace of vertical planes, three of which are *L,P,* and *O*. It contains the vanishing points *p,x,* and *q* of lines lying in those planes.)

Thus in Figure 363, the line *a* is a horizontal line—that is, a line parallel to level ground,—and it lies in a vertical plane, *L*—the side of the house. The line *a* being horizontal will have a vanishing point on the horizon—it may be found by extending

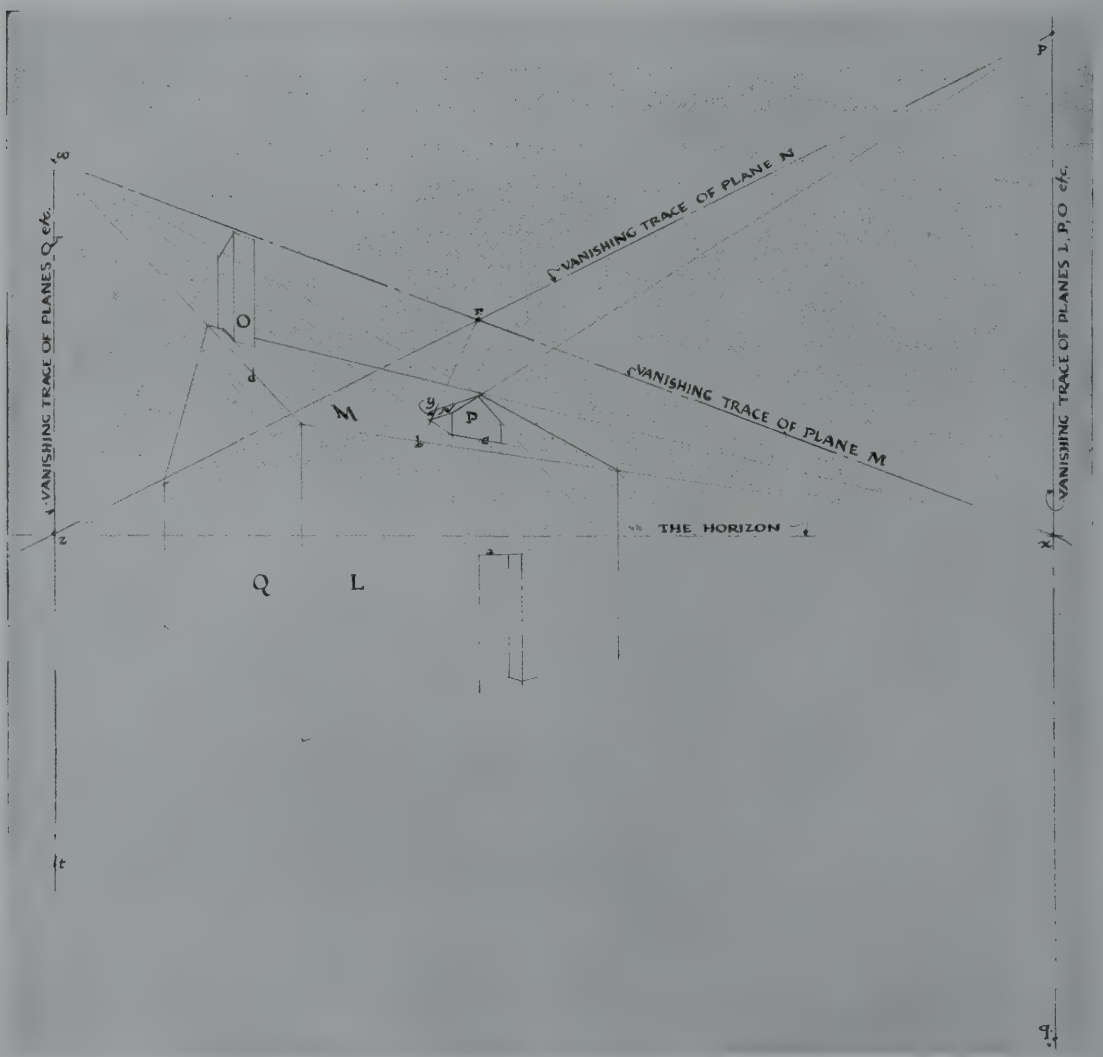

Figure 363. Vanishing Points and Vanishing Lines.

the line until it cuts the horizon, at *x*. (This will be the vanishing point of any line parallel to *a*—(such as *b*, the eaves, and *c* on the dormer window.) If we draw a vertical line through *p,x,q*, we shall have the vanishing trace of the plane *L*—and of any plane parallel to it, such as *P*, the front of the dormer window, or *O*, the front of the chimney.

Now we shall see why all this is of very great use. Every plane has a vanishing trace, as we said, (and this includes oblique planes such as *M* and *N*, of course) and any line lying in a plane has its vanishing point in the vanishing trace of the plane; in fact, any vanishing trace may be found by drawing a straight line through the vanishing points of two different sets of parallel lines lying in a plane. We make use of this if we want to find the direction of such a line as *y*, a line in which two oblique planes meet (*M* and *N*). Think of it in this way. The line *y* lies in two planes—if we can find the vanishing traces of these two planes the vanishing point of the line *y* will, of course, occur where these vanishing traces cross. We can find these vanishing traces if we work back to lines we know something about—usually horizontal lines are the most useful —as we know they have a vanishing point on the horizon, which can be found by extending the line until it crosses the horizon. To find the vanishing trace of the plane *M:* we have one vanishing point of lines in this plane already—horizontal lines (*b* and *c* and the top and bottom of *O*) at *x*. We need find only one more: the line *d*, at one side will serve the purpose— because it is in a vertical plane (*Q*) and we know the vanishing trace of this plane will be a vertical line through the vanishing point of horizontal lines in this plane—*w. z. t.* is then the trace of this plane. If we continue the line *d* until it cuts this trace, we shall have its vanishing point, *w*, and that is what was needed to determine the vanishing trace of the plane *M*. We connect the two vanishing points then —*w* and *x* by a line (*w-x*) which is the vanishing trace of the plane *M*. In the same way we find the vanishing trace *z-p* of the plane *N*. These two traces cross at *r*—which then must be the vanishing point of the line *y* which occurs where these two planes cut through each other.

This will be much more intelligible if you read it through a second time; if you can understand it, you will find it much easier to visualize in perspective—and such men as Leonardo da Vinci and Michelangelo found it worth their while to do all sorts of problems in perspective, and enjoyed the sense of power given them by their success in solving these problems.

From such dry diagrams as Figures 358, 359, and 363, it is interesting to turn to Figure 357, which is a Rougevin second prize drawing at the Ecole des Beaux Arts in Paris. But it was no doubt made over a framework just as diagrammatic as Figure 363.

Drawings in parallel perspective—such as Figure 360, another Rougevin competition drawing—give all the aspects of being in perspective, and yet are, for the most part, elevation drawings. They are much more effective than the elevation alone would be.

The casting of shadows in perspective is another interesting field that should be studied, for in a perspective the sun need not be (preferably will not be) considered always at an elevation of 45 degrees. Some hours spent with Lubschez' book, before mentioned, or with Hatton's "Perspective for Art Students" (Chapman & Hall, 1910), will be well worth while—and then, after that,—*as much practice as possible*.

Figure 364. Elevation of Design by Grant Miles Simon, Winner of the Paris Prize of The Society of Beaux-Arts Architects for 1913.
For plan see Figure 171.

CONCLUSION

Chapter XXXVII

THE PSYCHOLOGY OF SUCCESS

WE WERE all taught when we went to school that all men are born free and equal. However, we soon realized that the equality was lost after birth. Some had wealthy parents; some had relatives or friends with "pull," and so forth. But in addition to any such inequalities that result from outside causes beyond our control, we soon see that inequality of attainment may result from such characteristics as the ability to concentrate, patience, a willingness to work, and many other qualities of the same sort.

This is true in life; and true in architectural practice and the study of design. This study of design, especially as conducted by the Beaux-Arts Institute, is very much like athletics—the medals go to the men *who win the sprint*, who top the highest bar in the pole vault, who keep a fast, even pace for miles in the distance race, and *have something left for the final sprint to the tape*.

To do these things the athlete keeps in training; the coaches feel he won't have a chance to win if he "breaks training"—he won't have the "punch" at the moment it must be counted on. The study of design in the atelier system is just as gruelling a process as any sport. If you mean to win—if you want to get to the top—keep in training. At the final effort your opportunity may depend on the last ounce of energy you can put into the contest—don't waste your vitality uselessly before that time.

There is a lot of useless working all night. Men who let their work slide—waste their time, or cover lots of paper, carefully drawing *the same thing over and over*—their minds seemingly partly asleep—who always have to "charrette" to finish a problem, are usually a poor looking lot when the Paris Prize second preliminary requires twenty-four consecutive hours of plugging—or when a competition makes a "charrette" a worth while thing.

Some men are able to work faster than others, and, of course, do not have to work as many hours to do the same quantity of work. The point I want to emphasize is this: some day it will be important for you to be able to count on your stamina, your vitality—your health, in fact, in a competition that means everything to you; don't let it dribble away foolishly because you may have gotten the idea it is "the thing to do." No athlete, of course, is ashamed to go to bed at nine o'clock—you do not need any excuse for making the most of your time.

To show that it is possible to succeed in Beaux-Arts work without a procession of charrettes, I mention one example. Billy Hough (see Figures 223 and 226), as a senior at college (School of Architecture, University of Pennsylvania) was, in season, on the football team, basketball team, track team—varsity teams all—(practice four to six hours each day, bed at nine) was Art Editor of the *Punch Bowl*—a monthly humorous magazine—and of the class *Record*, took the part of the heroine in the Architectural Society play of that year, and also of the Psi Upsilon play—and was one of the best men in his class in design—a class that had in it four men who later won the Paris Prize—Ellington in 1911 (see Figure 222), Kirkpatrick in 1912 (see Figures 254, 255), Simon, 1913 (see Figures 170, 171, and Figure 364), and Sternfeld in 1914 (page XII and Figure 270). Hough ended the year by winning the Stewardson Travelling Scholarship. When he came back to study for his Master's Degree, he was admitted as a logist (1913) in both the Paris Prize and Rome Prize final competitions—withdrew from the former to take the latter, and won.

This matter is one in which the critic will not feel called upon to give advice—it is up to each man to work out his own salvation.

At the same time, to get anywhere at all, it is necessary to work and work hard. Do as many problems as you can, put as many hours into each as you reasonably can—but make what time you do put into them count to its fullest extent by keeping at it so that your brain will be active—so that no line will be drawn without a good reason. These reasons become sub-conscious in time, so it is all the more important to start your training with a sensible idea of the proper use of time.

Do not be discouraged by not having immediate success. Some men do win big prizes on their first try; it may be a lucky chance, or it may be well deserved; but if we look at the record of the Prix de Rome competitions at the Ecole des Beaux Arts in Paris—the apex of school competitions in architectural design—we find frequently that a man has won after four, five, six, or more attempts: that such a man is apt to be found "in the running" year after year, placing second, third or fourth at each try. A man has to be good to place second in the Paris Prize Competition three times in succession as did Burnham Hoyt in 1912, 1913 and 1914.

In the 1911 competition Simon was placed fourth. The jury in its report, stated that his work was clever, showed great ingenuity and imagination, and suggested that if this designer submitted to the regular discipline of the Beaux-Arts training he should develop well. When he tried again and won in 1913 (see Figure 364), after trying to make his design logical and conservative with this report always in his thoughts, the jury's report expressed the one regret that his work was perhaps lacking in imag-

Figure 365. Plan of Winning Design by D. McLachlan, Jr., Winner of the Paris Prize of the Society of Beaux-Arts Architects for 1920.

Figure 366. Elevation of Winning Design by D. McLachlan, Jr., Atelier Hirons, 1920 Paris Prize of the Society of Beaux-Arts Architects.

ination, and called attention to the brilliant imagination shown in the drawings of Hoyt, placed second, (see Figures 288 and 368).

You must remember that the jury is "human"—it is not a fixed and immutable thing like a mathematical quantity. You must get used to the variability of the standard of awards in jury decisions. The Beaux-Arts Institute jury varies somewhat in personnel with each jury, but even if the jury were composed each time of the same men there would be a difference of opinion on matters of taste at least, for art and taste are not mathematical entities that can be closely limited and sharply defined.

Sometimes the jury seems "lenient"; sometimes "hard-hearted"; sometimes stressing "the idea"; at others, looking more particularly at the study that has been spent on the idea, and so forth.

This variability is true of life—of clients. It is a well known fact among painters that a canvas may be rejected by the jury for an annual exhibition—and if sent to the exhibition at the same place the succeeding year, be accepted. It was turned down the first time not because it was unworthy, but because it had no particular appeal to the men who composed that particular jury. Fortunately, architectural design is less subject to caprice or questions of personal taste than painting; the practical requirements of architecture always tend to keep its feet on the ground.

For all these reasons one should avoid "playing to the jury," if you know who they are to be, for you may guess wrong on their predilections—or you may not know one of them who may turn out to be the strongest, the most persuasive (or most stubborn) among them.

Do your best as you see and feel and understand architecture—and take your medicine philosophically, studying your failures in comparison with premiated work in a sincere effort to pull up closer in the next contest. Hunt for the faults—not in the jury, but in your own work. Is it, honestly, the best that could be done? Are there not some places that you feel yourself could have been improved, had you had a little more time? Was your trouble, perhaps, in not laying out your time wisely?

Certain things stand out as necessary for success with a jury in competitions in architectural design:

1: The parti must be good—it must solve the requirements of the problem—cleverness of presentation, of detail, of the study of certain parts, may all win "commendation"—but they never win a competition for a scholarship or a prize if the parti is faulty.

You will at once see that here success depends to a great extent on good thinking at the time of making the esquisse.

2: Drawings must be well studied—there should be no appearance of awkward corners or undigested poché in plan, or ill-chosen or badly placed ornament or features in elevation; both elevations and plan must have good proportions.

3: The design must be interesting—not commonplace. We have already spoken of the work of Burnham Hoyt in this respect. Of course "there is a time for everything" and it would be foolish to attempt to dress up a problem with all kinds of "folderol" if it is uncalled for. There is, at times, a value in the most extreme simplicity—but the greater the simplicity, the greater the study required to make that which is put in absolutely satisfying. A design may be imaginative even though dignified and severe, as may be seen in McLachlan's Paris Prize of 1920, (Figures 365, 366, 367), another monument problem.

4: The design must be well presented, to appeal at once to the jury. This means well drawn, and well rendered; the architecture well modelled, the third dimension well expressed; entourage well studied in relation to the architecture and rendered in proper value. It also means that the sheet must be well "composed" as a sheet—some part emphasized as a focus and everything else arranged with this in mind; the different drawings arranged to "compose" with each other, borders made to work with the lines of the "châssis" or stretcher frame.

Figure 367. Detail of Elevation by D. McLachlan, Jr., Winner of the Paris Prize of the Society of Beaux-Arts Architects for 1920.

Figure 368. "The Monumental Treatment of the Lower End of Manhattan Island," by Burnham Hoyt. Placed Second in the Paris Prize Competition for 1913. (See Elevation, Figure 288).

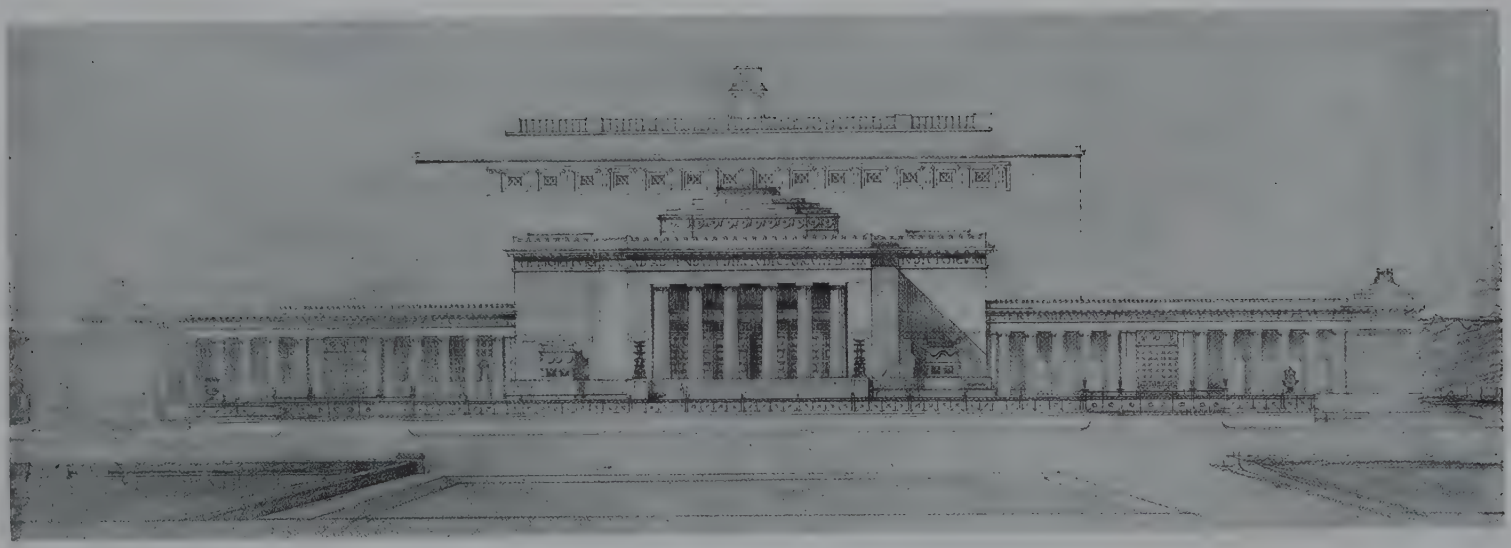

Figure 369. Pencil Study of Elevation of Design for a Crematory, Class A Projet, by J. L. Evans. One of several made in the last week of studying the problem.

Figure 370. Pencil Study of Section of Design for a Crematory, Class A Projet, by J. L. Evans. Done on detail paper so that erasures may be made to try out different ideas.

Figure 371. Pencil Study of Elevation of Design for a Crematory, Class A Projet, by T. P. Yang. Note that the columns have been changed, at the left, from Ionic to Doric, greatly improving the aspect.

Figure 372. Pencil Study of Section of Design for a Crematory, Class A Projet, by T. P. Yang. These two studies, like those on the previous page, were made on a heavy paper. Such studies will stand a great amount of changing.

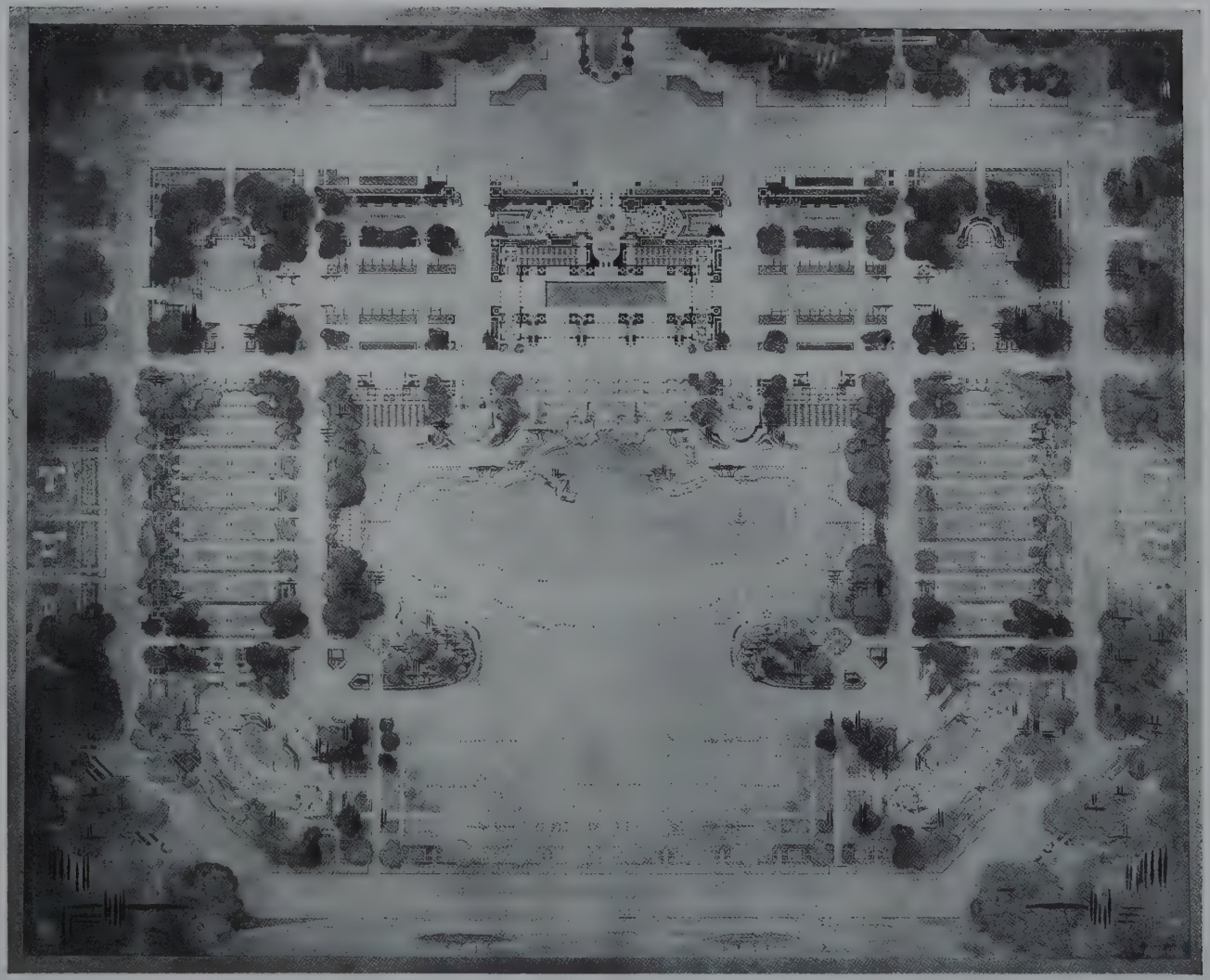

Figure 373. "A Natatorium," by Carl E. Landefeld, Winner of the Paris Prize of the Society of Beaux-Arts Architects for 1926.

In a scholarship competition it is also essential to have all drawings equally complete—plan, section, elevation, all carried to the same point, and not one elaborately finished at the expense of the others.

Good drawing and presentation alone, as we have just said, will not win a competition—but they always insure a careful consideration on the part of the jury, while a poorly presented drawing is at a great disadvantage in this respect.

And finally, do not work for immediate results. Try to work toward a future goal of ever greater knowledge of design, a surer sense of proportion, an increasing vocabulary of forms, greater ability at expressing and presenting this knowledge, and a sound method of making the most of conditions, of available time, of procurable documents and of sound criticism. With one's endeavors pointed in such a general direction, success will come one day or another—but come it will!

We have spoken of the necessity for hard work. And yet, from another standpoint, this "work" may be more reasonably thought of as play. It is in the spontaneous play of his faculties that man finds himself and his happiness.

If you feel that you have done well, do not be discouraged from further effort if the jury has not given you a high award. I have spoken of these awards by the jury as if they were the final word, as if all values in life could be measured by the values appraised by such juries. And yet now and then there is one—usually an original thinker—who has a novel idea which is intrinsically good, but which, because of its very novelty, repells the members of a jury, who may have a different disposition, or training. We take a certain pleasure in having our own judgments supported by those of others; but the true basis of our taste is in our own experience and, when this is formed, we must have the courage to stick to our convictions long enough to give them a thorough trial.

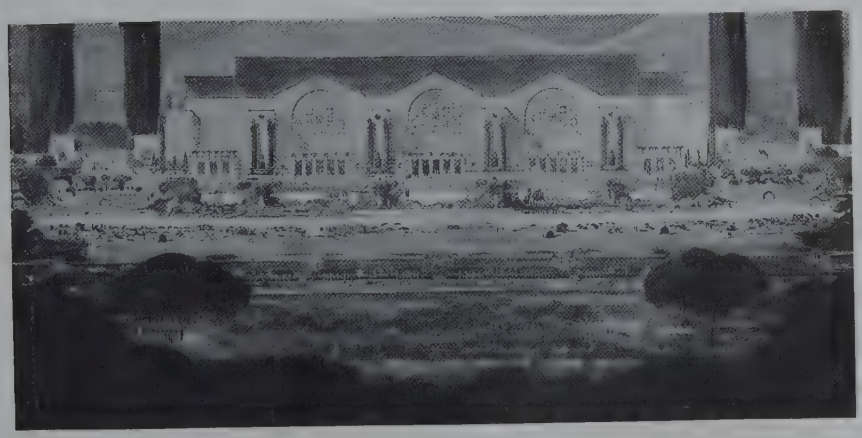

Figure 374. "A Natatorium," Paris Prize, 1926, by Carl E. Landefeld.

Figure 375. Drawing from Life by George Bellows.

CONCLUSION

Chapter XXXVIII

A BACKGROUND

WE have been speaking only of architecture: and yet, if one is to succeed in architecture he must have a knowledge of many other things, he must not have a "single-track" mind. We mentioned, when speaking of studying a problem, that one should make an investigation into the life that would go on in the building designed to answer that problem—that to design a railroad station well, one should go into a railroad station and watch what the crowd does there, how the freight is handled, etc. In the same way there is needed for a future in the field of architecture, what might be called a background—a background of funded experience, stored up to meet and answer the emergencies, large and small, that come to one throughout life.

We find that we cannot do well in design without knowing something of the history of architecture and the growth of the styles: we find that to get the most out of architecture we cannot play favorites too closely with these styles or have pet aversions among them, but must look for the interesting, the beautiful, the structurally satisfying qualities in each style. "It is important that we approach the study of architecture with an open mind; that is, without pre-conceived ideas as to the superiority of one style over another, and above all, without any inclination to find religious or moral sanction for the method of design which appeals most to our individual temperament. Be on your guard when you find writers talking of corrupt and decadent styles. Art is more vital in some ages than others, but an observant student will find something to admire in the depth of decadence."*

Egyptian art may seem sinister, monotonous, but from it we learn the lesson of gigantic scale. We generally are prepared to admit the fineness of Greek architecture, the beauty of Greek detail. But we must not, because Roman ornament is patterned after the Greek, and is, generally speaking, executed with far less perfection of finish, lose sight of the power of Roman architecture, its majestic scale, its structural triumphs, its achievements in "city plan" and "civic center" arrangement, qualities worthy of the rulers of the world.**

We all admit the mystic beauty of the Gothic vaulting system, the ingenuity and engineering knowledge that went into its stereotomy, the soul-satisfying color of the stained glass of the Middle Ages, and the personality and individuality of its sculpture and its carving. But we must not, on that account, close our eyes to the simpler beauty of many Romanesque buildings, nor to the many solid architectural qualities of that period. We have but to look through Arthur Kingsley Porter's "Lombard Architecture" to have these qualities forcibly thrust upon us.

And again, we have been brought up to appreciate and admire the work of Bramante, of Brunelleschi, of San Michele, Michelangelo and Palladio, but alas, we have also, due perhaps largely to the writings of Ruskin, looked upon the work of the Baroque architects as over-loaded, gross, unrefined. Yet it is in the Baroque period that architecture lost the "boxy" character so prevalent in the time of Bramante and Brunelleschi; that architecture came to be truly sculptural—a study of compositions in masses, instead of a screen of two dimensions on each side of a building. Due to the new zoning laws, architecture is going through much the same evolution today. But because we have inherited the Ruskin tradition it is doubly worth while reading Geoffrey Scott's "Architecture of Humanism", which calls itself frankly a justification of the Baroque, but which, in addition, is a very sane exposition of the underlying principles of architectural composition, and a keen assaying of architectural criticism. And for the same reason—because of its clear setting forth of the principles underlying architecture—time is well spent in reading the chapter on "Modern Architecture," by Paul Cret, in "The Significance of the Fine Arts"* published under the auspices of the American Institute of Architects.

All these books will have a broadening influence: they are all, however, still architecture. If we are truly to be broad-minded we must climb out of our rut still further. It is but a step to painting and sculpture; there are, within the reach of almost all, either permanent or temporary collections of paintings and sculpture. And here again, we must not with pre-conceived ideas—due again to what I have called our Ruskin tradition—look only at the accepted, the academic. We should try to understand what the "modern" painters and sculptors — Cezanne, Matisse, Picasso—are attempting and this while still seeing all the beauty in Giotto, Giorgione, Titian or Velasquez. Here again a book will help: "The Art in Painting," by Dr. Albert C. Barnes, a volume which gives a history of painting as well as an exposition of the qualities of composition and technique in painting, written without the use of the technical jargon that makes so many art books unintelligible to one not trained as a painter.

*"*The Mistress Art", Reginald Blomfield; Edward Arnold, London, 1908.*

**See "Roman Architecture and Its Critics," by A. D. F. Hamlin, The Architectural Record, May and June, 1915.*

*"*The Significance of the Fine Arts", Marshal Jones Co., Boston.*

Figure 376. Pencil Drawing from Life by George Bellows.

And for the theories underlying all art we might set aside for vacation reading the following list: "The Philosophy of Art," by H. Taine; "The Sense of Beauty", George Santayana; or the "Ars Una" of the Apollo series, which, however, is mainly illustrations, with a very small accompanying text.

And going further afield, there is all of music in which to take enjoyment, to freshen our imagination, to expand our emotions. There is the opera: and again let us be big enough to look for the message of the opera of the classical school and the interpretation of opera by the more radical younger set. Let us see "Carmen" given by the Metropolitan Opera Company; let us also see "Carmencita and the Soldier", by the Music Section of the Moscow Art Theatre.

The orchestra, too, is rich in education, immensely rich if we can seek beauty in Bach, in Beethoven, in Wagner, and also in Strauss and Stravinsky and the "Group des Six".

The theatre has its value as a broadening influence, as an education; certainly so when we see the classics well acted, or the modern plays of interesting playwrights, of Ibsen, Bernard Shaw, O'Neill.

The opera, the orchestra, the theatre—these take time, they also are expensive. There is another method of reviving one's soul that costs, at most, very little, and that need take only such time as is unusable for other purposes,—coming and going on trains, the few minutes after dinner, when one is not yet in the mood to sit down at a drafting table —the few moments waiting for some one. At these times a book is always a worthwhile companion, and, if taken one at a time, a companion causing no trouble.

And how much there is to choose from. Is it a novel? Let us read Lawrence Sterne's "A Sentimental Journey", or Fielding's "Tom Jones"—two of the first of the English novels; these down to Stevenson, Hewlett, Hardy, Conrad, and Anatole France. If we have but a few minutes, there are the "Essays of Elia", or Poe's imaginative writings. One of the finest descriptions of an architectural site is in Poe's "Domain of Arnheim", told in a finished literary style.

And if we can spare a little longer time we could devote it with profit and interest to a reading of Well's "Outline of History", and from there to further reading in some of the periods that have been strangely neglected in our school preparation and yet are fascinating when we come upon them—the story of Jengis Khan, for instance, or of the Christian Church in the first few centuries after Christ.

This is not architecture, you may say. "The reading of books will not make an architect, his proper study must always be buildings." Yet an architect cannot design intelligently for the many phases of our present-day civilization if his work is not founded on a broad cultural knowledge.

And with this cultural development we would do well to try to improve our technique in expressing design in three different ways. By outdoor sketching, or indoor attempts at "still-life" compositions in water color, or renderings of objects in museums, we can build up a knowledge that will be of immense help in rendering. By joining a modeling class, with due humility befitting one who knows he is not destined to be a sculptor and resolved to avoid any feeling that such a superficial knowledge is anything more than a superficial knowledge, we will be able to understand more easily the thickness of things, the reality of the third dimension. And by working in the life class we may "increase the skill of hand and deftness of finger as well as form a power of trained observation" most useful in architectural design. And these drawings, like the sketches from nature and the modeling, will be only a by-product, not an end in themselves, but only a means toward a greater knowledge of form and one's own power of expressing it.

All of these cultural activities will have a very real effect upon your development; this "development will depend upon two things—that you be born with genius, which depends on your parents, or at any rate on your ancestors, *and that you give your devoted labor,* in order to master your art, which depends entirely on yourself."*

**Essays and Memorials, John W. Simpson, P.R.I.B.A.*

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A VOCABULARY OF FRENCH WORDS USED IN THE ATELIER

For a number of years our best educators in architecture were Frenchmen—and many Americans who were teaching had finished their own studies at the Ecole in Paris. These men had become used to some words that, in the atelier, had a distinct meaning, and so they were used in the ateliers here. Those words that serve a useful purpose will become a part of our language—those that have a useful English substitute will be forgotten.

We could, if we wished, speak of a gasoline carriage instead of an automobile, and store such a machine in a carriage house instead of a garage—we might advertise for an engineer-driver, instead of a chauffeur—but we do not. And when we say limousine, or tonneau, or chassis—or to go back to an older importation, chandelier and chiffonier—we have no idea of affecting "Frenchisms". Foreign words creep in because they express a shade of meaning slightly different from a nearly equivalent English word. And in the same way, we find that in France many English terms are in current use for sports, and that "lyncher" is a verb made from our word "to lynch"—there was nothing in the French language to express that idea. When the word "mob" was first used, the conservative English objected strenuously until Dean Swift gave it countenance by using it: and no one questions its use today. Whether one likes it or not, words will creep in—either from foreign languages or from slang—as popular need demands them: after all it is "the street" that dictates our vocabulary, and not "the academy."

No attempt has been made to indicate the pronunciation which should be learned from someone who speaks French correctly.

The abbreviations used are as follows: *n.*—noun; *m.*—masculine; *f.*—feminine; *pl.*—plural; *adj.*—adjective; *adv.*—adverb; *v.*—verb; *arch.*—architectural.

A

Analytique: (a) *adj.;* analytical; (b) *n.m.; arch.,* a projet which is the study of the elements of architecture.

Ancien: (a) *adj.;* old, antique; (b) *n.m.;* an old student, a senior.

Atelier: *n.m.;* a work shop, a studio, a drafting room.

Axe: *n.m.;* axis.

B

Beaux-Arts: *n.m. pl.;* fine arts.

Bosquet: *n.m.;* a small clump of trees.

Bossage: *n.m.; arch.,* coursed ashlar with a roughly dressed or projecting surface.

C

Cartouche: *n.m.;* an ornamental medallion; *n.f.;* a cartridge.

Charrette: *n.f.;* a cart; *en charrete* (slang, *arch.*), the final drive to complete a projet.

Châssis: *n.m.;* a wooden or iron frame; *arch.,* frame on which a drawing or painting is to be stretched.

Château: *n.m.;* a castle, also a palatial country residence; *château d'eau,* the architectural front of a reservoir of water.

Concours: *n.m.;* competition; *hors concours* (H. C.), *adj.;* ineligible to compete.

Croquis: *n.m.;* a sketch.

D

Dallage: *n.m.;* a floor or pavement of marble, stone or tile.

E

Echelle: *n.f.;* (a) a ladder; (b) *arch.,* scale, as of a drawing.

Ecole: *n.f.;* school.

Entourage: *n.m.;* environment, followers; *arch.,* the grounds immediately surrounding a building.

Envoi; *n.m.;* the action of sending, the thing sent; *arch.,* a drawing made by a scholarship student to be sent to his masters.

Esquisse: *n.f.;* a sketch; specifically the nine hour sketch made *en loge* at the beginning of a projet.

Esquisse-esquisse: *n.f.;* a rough sketch, applied in the Ecole des Beaux Arts to the twelve-hour and twenty-four hour sketches.

F

Foyer: *n.m.;* (a) home, hearth-side; (b) the part of the theatre where the public congregates during the entre-actes; (c) the focus of an ellipse.

G

Gouache: *n.f.;* Chinese white, color mixed with Chinese white: i. e., solid color.

Grand Prix, see *Prix.*

Grisaille: *n.f.;* a style of painting in which only gray tones are employed, in imitation of sculpture.

H

Hors concours, see *Concours.*

J

Jardin: *n.m.;* garden.

L

Loge: *n.f.;* a small hut, cabin or lodging; *arch.,* a small room or stall in which a student is enclosed to work alone.

Logiste: *n.m.;* a student admitted to a loge for a competition, usually applied to those doing the Prix de Rome competition.

M

Massier: *n.m.;* the student head of an atelier.

Medaille: *n.f.;* medal.

Mention: *n.f.;* mention; *arch.,* a passing mark.

Mosaïque: *n.f.;* mosaic.

Motif: *n.m.;* motive; *arch.,* an element in a composition.

N

Négligé: *adj.;* neglected, insufficient; *esquisse-négligée,* insufficient sketch.

Nouveau: *adj.;* new; *n.m.;* a beginner in an atelier.

P

Parterre: *n.m.;* flower garden; also, that part of a theatre or auditorium situated behind and at a slightly higher level than the orchestra stalls.

Parti: *n.m.;* scheme, idea, intention.

Patron: *n.m.;* teacher, master.

Pocher: *v.; arch.,* to fill in with black ink, as the walls of a plan.

Poché: *n.m.;* the walls of a plan blackened in; the study of a plan with reference to the walls and piers only.

Prix: *n.m.;* price, prize. *Grand Prix de Rome:* scholarship to Rome awarded at the Ecole des Beaux Arts, as a result of a competition in architecture, the most difficult student competition; open only to French citizens.

Projet: *n.m.;* a projet, problem, set of drawings.

R

Relevé: *n.m.; arch;* a restoration.

Rendu: *n.m.;* the coloring of a drawing; also, the finished projet; also, the delivery of the projet.

S

Sous Massier: *n.m.;* the assistant of the massier, a secretary, clerk and office boy combined in one person.

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